

THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

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Marketing Herbs.
See page 4.


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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

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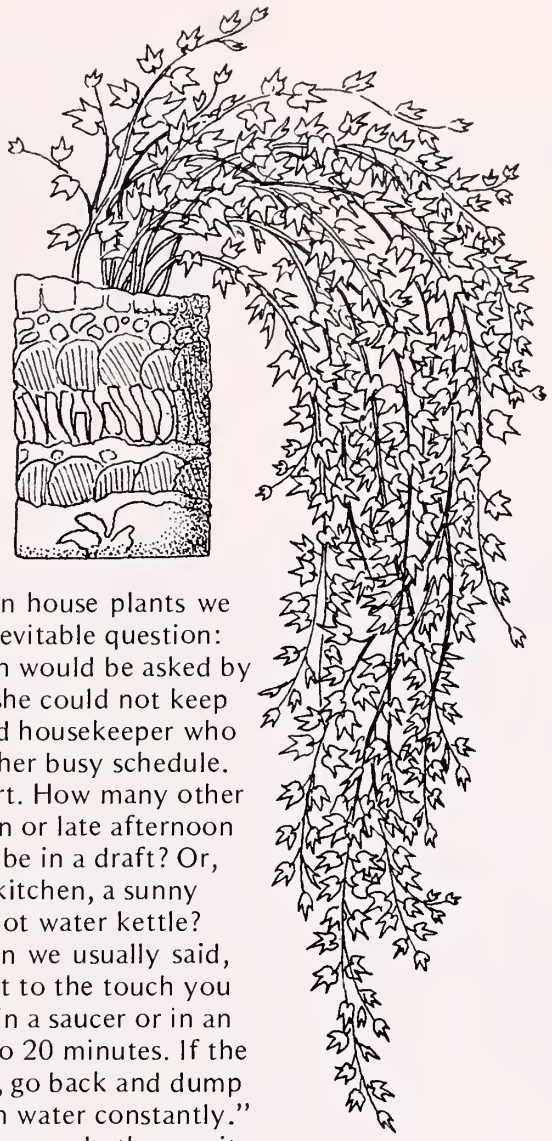
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Front Cover: Georges Perrier of Le Bec Fin checks a newly arrived basket of herbs. The basket contains chervil, applemint, pineapplemint, fennel, basil, sage, and sorrel. (See p. 4.)
photo by Edmund B. Gilchrist, Jr.

Back Cover: The Red and Blue Garden at Leaming's Run. (See p. 14.)
photo by Barbara Bruno

GREEN HABITS: PLANTS ARE NOT PIECES OF FURNITURE



When I worked in a greenhouse specializing in house plants we often longed for a tape recorder to answer the inevitable question: "How often do I have to water it?" This question would be asked by the timid new owner who was really afraid that she could not keep the plant alive; it was demanded by the organized housekeeper who wanted to know the time required for plants on her busy schedule.

Answering involved more questions on our part. How many other plants were nearby? Would it receive morning sun or late afternoon sun? Was the room kept at 75° or 65°? Would it be in a draft? Or, with good luck, would it be in the bathroom or kitchen, a sunny morning room full of steam from showers, or a hot water kettle?

Not always knowing each customer's situation we usually said, "Feel the soil. If it feels dry, water it; if it's moist to the touch you can wait until later. Never, never keep the plant in a saucer or in an undrained container of water for more than 15 to 20 minutes. If the excess water hasn't been soaked up by that time, go back and dump it out. The bottom roots will rot and die if left in water constantly."

Plants droop with inattention, yes, but unlike people they wait quietly for attention. They turn their leaves, themselves, toward the light, so you must not interrupt this process by selfishly turning a plant completely around again toward your view, except maybe, for a short period at night or for special occasions. As each leaf is to be considered a factory providing growth, all energy will be spent turning its leaves back to the light again. A quarter of a turn a week is enough to make a plant well-rounded and bushy on all sides. A piece of furniture or sculpture may be placed in a corner on a stairway or on a coffee table yards from direct light and turned to suit your taste, but not a plant.

If you really want plants, you must have a "green heart" as well as a "green mind," which is usually called having a "green thumb." Be prepared to spend many "green" moments learning "green" habits. Otherwise, I suggest you spend some of that "green" stuff, if you have any, to buy some artificial plants. They make excellent reproductions these days and are sold in furniture stores. (And you won't have to spray the bugs!)

Ann Newlin Thompson

Ever since she worked for Ernesta Ballard at Valley Gardens, Nan Thompson has been caring for house plants and helping others to learn. She is now supervising the garden and grounds at Wyck, in Germantown. She says: "Maintenance, indoors or out, is making things look as though somebody cared."

MARKETING HERBS

by Julianne R. Street

Our horticulturist took bags of sorrel to a meeting place south of Wilmington and handed them over to a chef who had driven up from Washington on his motorcycle to get them for a Bastille Day dinner party.



photos by Edmund B. Gilchrist, Jr.

The author handles distribution from the West Chester area to a center city restaurant.

Joanne Eilbeck (in striped shirt) and Kim O'Brien sort and weigh herbs before they are packaged.



When I first announced, "I am going to grow herbs," I did not know tarragon from thyme. Yet 30 years later the sunny slopes of Apple Pie Farm are covered with rows of fragrant culinary herbs ranging from basil to thyme, with the shady spots sheltering woodruff. And these many herbs supply a network of restaurants, gourmet shops and private individuals throughout the United States. They go out in fresh packets, ice containers, baskets, herb vinegars, Christmas decorations made of fresh and dried herbs and whatever else along those lines might be called for.

Initially I grew herbs because I enjoy good food and I like to cook. Indeed, the farm was named by my late husband as a tribute to my pies when the family first settled in West Chester in 1950. I stepped beyond Apple Pie Farm because I felt sorry for Georges Perrier, the owner of Philadelphia's famous Le Bec Fin restaurant. Perrier let the world know in the *Philadelphia Inquirer* (July, 1974) that he thought the progress of cooking in America was seriously hampered by the lack of fresh herbs in our markets. He longed for the herbs of his native France: chervil, tarragon and thyme—all essential to good French cooking. At that time my herb garden was very small and framed a brick patio a few steps below my kitchen. After reading the article, I was haunted by the thought of poor Georges every time I looked at it. As I snipped some herbs over my salad, I decided that I had to share my bounty with him. With the help of two friends—one American and one French—I was soon sitting in Le Bec Fin. My French friend assisted in the business transactions. I had brought a huge basket of aromatic, recently cut herbs and it sat between Georges and me. He looked, sniffed, and bought; I was in business. The first sale was $13.00.

The following year a substantial part of my shrub enclosed vegetable garden was turned into herb patches, and I was able to supply him with all he wanted.

continued

MARKETING HERBS continued

Near the end of that growing season it seemed obvious that if Georges liked the herbs that much, other chefs would also like to have them. So with that same basket filled with bunches and bags of herbs I called at other Philadelphia restaurants and talked with their chefs. Some did want them, ordered whatever was still available and asked to be put on our customer list for the next season. During the winter I ordered more plants and seeds for spring planting. Early in the summer of 1976 we started weekly deliveries to other Philadelphia area restaurants: La Panetiere, La Truffe, Les Amis, The Garden, Morgan's, The Coventry Forge Inn as well as others specializing in French or Continental cooking. The word spread and soon customers started calling me. Although our sales had jumped dramatically we were still selling only locally so the volume was limited.

expanding markets

I soon began to dream of those hundreds of French chefs across America who would, if given the opportunity, become ecstatic at the sight of a basket of fresh herbs such as ours. In discussing plans for the future of what was rapidly becoming an "herb business," one of my brothers pointed out that I was not far from New York. That did it! My sights were reset, the big basket was filled again—this time with a pot of red geraniums in the middle. Late in the summer of 1977, a friend and advisor, Lou Capitola and I took the basket and walked into the kitchens of some of New York's finest restaurants. We are still going to them.

Our New York business got a tremendous boost in February 1978 when Craig Claiborne mentioned our herbs in the *New York Times.* He quoted Joseph Renggli, the celebrated chef of The Four Seasons restaurant in New York. Renggli (known as Seppi) contended that he had one of the finest herb suppliers on the East Coast, naming Apple Pie Farm. Our telephone rang for days after that, and we still get mail from people who clipped the article. The combination of "basket sales" and *New York Times* publicity brought about the need for expanded production. We had to go beyond the existing garden for the necessary space, so we plowed part of a five-acre adjoining field and laid it out in squares and patches following the same general pattern as the vegetable garden. The steep hillside that faces south was planted with thyme and tarragon. The squares, which are a sort of continuation of the original garden, were planted with the other herbs—with grassy paths dividing the patches to facilitate weeding and harvesting. A large tub of red geraniums was placed in the middle, and this garden was thenceforth called the Geranium Squares. The original garden became known as the Inner Garden. The tiny kitchen patio garden is reserved for my use and also serves as a sample garden—for pinching and smelling.

With the additional plantings we were able to start regular weekly deliveries to New York in the spring of 1978. Our customer list there has grown each year and now includes, in addition to The Four Seasons, Grenouille, Le Cirque, Le Chantilly, Le Perigord, Dodin-Bouffant, The Oyster Bar and Restaurant in Grand Central Station and The Manhattan Market Restaurant. The Soho Charcuterie and Restaurant, and The Silver Palate are also customers and Dean & DeLuca in Manhattan and in East Hampton purvey the herbs along with all their other mouth watering delicacies. Baron Roy Andries de Groot is a regular and devoted user of them too. The most recent addition to our customer list in The Big Apple is Bloomingdale's where they are now available in their Fresh Foods Division.

Business in Philadelphia also had a great boost in July 1978 when Elaine



From a handkerchief size herb garden, the enterprise has grown to almost six cultivated acres.



Kathy Forrest packs the coolers for distribution to the restaurants. The herbs go in first, a rack with specially drilled holes goes in next and artificial ice packs are placed with holding strips on top of the racks.

Tait wrote a long article about the herbs for a Sunday Edition of *The Philadelphia Inquirer*. In November of that year we received a telephone call from Mark Caraluzzi, owner of The American Cafe in Washington, D.C. He wanted to know, "When are you bringing your herbs to Washington?" So—I and my intrepid friend Lou, who cares about herbs as much as I do, went off to Washington in April 1979. We had a delicious lunch with Mark followed by visits and referrals to other restaurateurs and chefs in the area. Now we supply Mark's two restaurants, as well as The Big Cheese, The Broker, Le Pavillon, Restaurant Nora, The Hyatt Regency Hotel and have arranged to start deliveries to The United States Senate Restaurants this season. One of them is called "Mother Herb" so we have great expectations for contributing to its continued popularity. Mark, who is famous in Washington for his delicious Chicken Tarragon, has become our number one tarragon customer—10 pounds per week!

In addition to these scheduled deliveries, we ship by United Parcel Service and Hub City Express to any place in the United States where the appropriate services exist. We've acquired customers, both individuals and restaurateurs, in many far away places thanks to a group of food editors who visited The Herb Patch in June 1979. Elaine Tait arranged for them to visit the farm and have a picnic lunch here. They liked what they saw, went home and wrote about it for their papers so we have received a lot of publicity. We have shipped as far away as Seattle; The Fairmont Hotel in Denver is a regular customer and we have just received a request for a price list from Las Vegas. In 1980 we have gone further into the five-acre field and this time have arranged our planting so that we can cultivate the rows with a rototiller hoping to cut down on labor. New products have been added; the customer list continues to grow and the staff increased accordingly.

It is a very good feeling to know that our herbs have been used in some of the delicious food served to famous people and visiting dignitaries from Europe—including Pope John Paul.

staff

There are a dozen or more women and teenagers who do the planting, weeding, watering, fertilizing, edging, harvesting, packaging, packing and some delivering. Two work full-time; the others are part-time, which enables them to handle their home and school commitments. One young man does the heavy moving and rototilling. Until 1978 all the work except some Saturday help we received from two longtime gardeners, Paul Pantelone and Romeo Guirastante, who have looked after the farm for many years, was done by two teenagers Peggy and Wendy Timpe and myself. Also, all the inside work was done in the farmhouse kitchen. In 1979 we remodeled an old chicken house into Herb House so now all the herbs are prepared in that kitchen. The vinegars are still made in the kitchen in the main house and herbs are dried in the attic. Some of the staff is local and part-time because of home schedules, or because the work is seasonal. The younger people are also local and work on weekends during the planting season and full-time during the school vacation. This year (1980) we have a full-time horticulturist—Lisa Freeman—for the garden and a part-time worker—Gertrude Hartshaw—to teach packaging and the making of the vinegars. Both had worked part-time during the past two years. We try to do as much on-the-job teaching as time permits and hope to do much more on an organized basis in the future.

In the beginning everything seemed so simple—just plant the herbs, harvest, bag and sell them. We learned that there are many facets of "going into business." In addition to producing bountiful disease-free crops one has to sell, clean, weigh, package, and label them; price, and preserve them; and then deliver them to the customer in absolutely fresh condition. There is also hiring, training, purchasing packaging materials, containers and ice paks; printers and drivers; making out delivery schedules, bills and endless paper work. And one cannot leave out lawyers, The Pennsylvania Department of Agriculture, Social Security and the IRS. One of the greatest challenges has been to package, pack and deliver the herbs in garden-fresh condition. We strive continually to improve in this area. For shipping containers we use styrofoam coolers when delivery is made by private car or truck and cardboard boxes when shipped by mail or United Parcel Service. Artificial ice paks are used in both instances. Some deliveries have been made by unconventional means such as the time our horticulturist took bags of sorrel to a meeting place south of Wilmington and handed them over to a chef who had driven up from Washington on his motorcycle to get them for a Bastille Day dinner party. They got there on time and the dinner was reported to be "magnificent"! Another time a friend and I made deliveries to New York on a rainy day, our car broke down, and we had to be towed to a garage for repairs. We couldn't start making deliveries until seven o'clock that evening. Of course the restaurants were open so that was

continued



In the kitchen at The Garden at 16th & Spruce.



An olfactory check at Morgan's at 24th & Sansom Streets.



Lunch break near the author's private herb garden.

no problem, but we didn't finish until eleven o'clock with the last delivery to a hard-to-find Cooking School in Soho. We arrived home at two o'clock the following morning. But our customers received their orders. We strive for excellence in all that we do and try to give individual service. At least a yearly visit to each of our customers on the East Coast is part of our goal.

rewards

If the challenges are great, so are the rewards. The world of food has many facets and I've enjoyed becoming a part of it. I've met many interesting people—including restaurateurs, chefs, food writers, photographers, purveyors of specialty items and business people in various areas—and have had many unusual experiences. I learn something every day so my horizons continue to broaden. It is a very good feeling to know that our herbs have been used in some of the delicious food served to famous people and visiting dignitaries from Europe—including Pope John Paul. Our mesclum (a salad that originated in Provence, made from baby lettuce, arugala or raquette and chervil) was served in Cleveland recently at a dinner to raise funds for the Cleveland Ballet. We watched the famous French Chef Jean Troisgros munch on our herbs. Hearing his commendation, "I didn't know you had such herbs in America," was rather special. In a letter from The Four Seasons Restaurant, Thomas Margittai wrote, "Just thought I would tell you how much my partner Paul Kovi and I appreciate what you are doing in helping us at The Four Seasons to maintain culinary excellence and our high standards." We worked even harder after that one.

Even though I don't have time to do much cooking now, it is always fun to see inside restaurant kitchens, to have demonstrations of techniques from great chefs or to swap recipes with them. To be invited to lunch or to dine at LeBec Fin, La Panetiere, The Four Seasons, Dodin-Bouffant, The Oyster Bar or other superior restaurants is especially rewarding and it does happen.

We have arranged to start deliveries to The United States Senate Restaurants this season.

acknowledgements

Many people have contributed to our success thus far. Nancy Howard and Joanna Reed of The Philadelphia Unit of The Herb Society have been especially helpful. It wouldn't have worked without family or friends and none of it could have come to pass without the loyal, hard working staff of Apple Pie Farm. The greatest satisfaction comes from the customers—for example in seeing the face of a famous New York restaurateur when he opened a cooler filled with bunches of fresh, fragrant, dewy herbs—looked, smelled and said, "We've never had anything like this before in this restaurant—they are beautiful!"

●

Julianne (Judy) Street's life has not always been so absorbed by gardening. In her other incarnation, she studied nursing at the Nursing School of The Children's Hospital of Philadelphia and earned a B.S. in Public Health Administration from Teacher's College, Columbia University. She helped to establish the Hospital Poliomyelitico for Crippled Children in Caracus, Venezuela. After the war, she was an orthopedic nurse in Greece. More recently she helped to establish The Bookworm, an ongoing project that sells books for the benefit of Phoenixville Hospital.

handbuilt ceramic containers

by Ellen Miller



photo by Edmund B. Gilchrist, Jr.

An unconventional use of a slab plate for an arrangement at the Flower Show. The arrangement won Priscilla-Gene Shaffer a second.

Flower arrangers and pot gardeners need special containers, ones made for specific uses and, ideally, designed to complement the plant material put into them. I found the container-plant relationship at the Flower Show rather disappointing in many ways. Some niche arrangements were often without any containers, partly because of prevailing styles, and partly, I suspect, because the special ceramic containers that might have been used were not easily available. Ikebana people, on the other hand, are very oriented to handmade containers—but almost all of what they used at the Show was imported production ware. The same was true for bonsai. In the horticultural section, one could hardly find a pot that was not ordinary red earthenware or plastic. These exhibitors are all artists who have spent countless hours selecting, training and otherwise working with their exquisite plant material. Perhaps they don't realize how readily their artistry can be extended to their own, specially created, containers.

After years of thinking that good pottery had to be wheel thrown, I became vaguely aware of something called "handbuilding" and enrolled in a course—and you might too, if your interest is piqued. My intention was to find out what was possible with little agility, limited work space at home, and no special equipment. The answer: a lot. With reasonable practice, the only limit is your imagination.

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handbuilding techniques

Pinching: By this method the clay is gently urged into shape and thinned with the thumb and fingers. Small pots can be made rather quickly from a single ball of clay; large ones take considerably more care. Containers can also be constructed by joining or building with two or more pinched pieces. While symmetry is certainly possible with the pinching method, its great charm and versatility lie in the freshness with which asymmetrical pots can be created. For a lively and thorough account, read Paulus Berensohn's book (see bibliography).

Coiling and piecing: Sophisticated cultures the world over (e.g., the Pueblo Indians, the Japanese and the ancient Minoans) have been making their beautiful pots since the beginning of time by building coil upon coil, firmly attaching each one before going to the next. Great control, symmetry and size are possible with this technique. The walls of the pot can be drawn up, shaped and thinned by pinching for a more delicate effect.

These elegant containers made by traditional methods are just part of the story; the other side is pure fun. The coils can be formed into circles, dots, squiggles and loops; they can be woven, twisted or braided; flat shapes can be incorporated into the design; holes can be left for plant material to emerge.

Slab construction: A slab is simply a piece of clay rolled out flat with a rolling pin, slapped flat on the work table, or cut into an even sheet with a wire. The single sheet can be shaped on its own, or cut into shapes that can then be joined together by overlapping or by reinforcing the abutting seams with coils.

The great advantages of slab building are the speed and accuracy with which geometrical shapes—cylinders, boxes, dishes—can be formed. Another plus: given that a slab has more uniform moisture content than a slowly-made pinched or coiled form, it can be folded, draped or otherwise manipulated in ways the other two cannot. Slab strips and shapes can also be built up in the manner of coiled and pieced pots with great creativity.

building with the help of another form

A pot can be formed inside another container lined with wet paper strips or plastic wrap to keep the clay from sticking (see illustration). As the clay dries it will shrink, making the pot easy

continued



1 Samples of slab pots: *Back:* Terra cotta planter and sculptured rabbit made by Helen Jones and Judy Romig. *Left foreground:* Ceramic with impatiens by James Romig. *Left:* The tall pot and the dark brown pot by Leanora Morrow. *Center:* Black circle and beige rectangle by Anne Hayes. *Extreme right:* Large free form brown pot, small double cylinders and large light circular pot by Bernice R. Makin.

2 Jean Salter's forest floor containers are inspired by nature. The sculptured containers are all hand modeled and set in separate trays. The plant materials are placed in glazed hollows. Flowers are violets. The pots are usually between 8 in. to 12 in. wide.

3 Pinched pots: *Back row:* Brown, blue and mottled beige pots by Libby Goldstein. The author sculpted the white broken egg shape (left) and double spouted pot on the right. *Center:* Brown star shaped pot by Patricia Mason. *Right foreground:* Irregular raku fired pot by Berthe von Moschzisker.



1

2



photos by Ellen Miller

3

ceramic containers continued

1 These pots made by the author are coiled and pinched, unglazed stoneware. The smaller pot contains a blue myrtle cactus and the larger a jade plant. Note the saucer (left), which was part of the design rather than an afterthought.

2 Bernice Makin, an Ikebana arranger, works with a slab-built container made by Leanora Morrow.

3 Pieced and coiled pots: *Center row (starting left):* Rounded pot, chalice and gourd-like pot: Ellen Miller. *Center:* Oyster-like pot: Berthe von Moschzisker. *Left rear:* Largest, light pot: Michael Williamson. *Left center:* Dark, irregular pot: Carol Drish. *Right:* Cactus dish: Patricia Mason.



photo by Ellen Miller

1



photo by Edmund B. Gilchrist, Jr.

2



photo by Edmund B. Gilchrist, Jr.

3

to remove at the leather-hard (rigid but still damp) stage or later. Any container to build on may be suitable: a bowl, bucket, sewer pipe, even a hole you dig in the ground if you can't find the shape and size you want.

A cylinder can easily be formed around a rolling pin, mailing tube or other similar shapes, wrapped first with dry newspaper to allow you to slip the clay away after it's shaped and before it dries.

Working on the outside of a hard or inflexible form is difficult because the clay shrinks. If the pot is not removed in time, it will crack. To avoid this problem, form around an extractable shape, such as crumpled soft plastic, a balloon, an old stocking stuffed with vermiculite, or a hump of wet sand.

finishing

If you do not like the rim of your pot, you can cut it off while it is still damp with an old paring knife or pair of scissors, or add a small coil to the top.

When the container becomes leather-hard to dry, it can be smoothed with a flexible scraper, available in art and pottery supply stores, or a half tin can lid or clam shell. For a very lovely effect, the leather-hard or dried surface may be burnished with a rock or a metal spoon. After drying, or after even bisque (preliminary, low-temperature) firing, the pot can be further smoothed and the rim refined by sanding.

decorating

You can impress objects upon the surface of a damp pot or slab: leaves, flowers, dried material; cut vegetable surfaces; kitchen utensils; hardware items; cloth, lace. Ridges, spines or veins can be pinched out. You can apply clay forms, making sure they are well attached by scoring and moistening the surfaces, or incise a design with whatever tool seems appropriate. The possibilities are endless.

glazing and firing

You must fire your pots eventually because green (unfired) ware is water-soluble. The technicalities of clay body mixtures, glazes and kilns are discussed in many of the references listed, and vary considerably from course to course. The easiest approach, perhaps, is to become familiar with the materials and facilities available to you as a student, and adapt these to your practical and artistic requirements.

inspiration

If the possibilities of making your own pots interest you, wonderful! Your imagination is probably full of expressive shapes and ideas; draw them in a sketchbook. Visit museums and galleries. Look at your plants or arrangement materials to see what they suggest. You will be delighted to find how quickly practice will enable you to create professional and very original containers.

Books

The Book of Low-Fire Ceramics by Harvey Brody. Holt, Rinehart and Winston, New York, 1980.

Ceramics. Sunset Books, Lane Publishing Co., Menlo Park, Cal., 1973.

Ceramics by Glenn C. Nelson. Holt, Rinehart and Winston, New York, 1978.

A Century of Ceramics in the United States by Garth Clark and Margie Hughto. E. P. Dutton, New York, 1979.

Clay and Glazes for the Potter by Daniel Rhodes. Chilton Book Co., Radnor, Pa., 1973.

Finding One's Way with Clay by Paulus Berensohn. Simon and Schuster, New York, 1972.

Handbuilding Ceramic Forms by Elsbeth Woody. Farrar Straus Giroux, New York, 1978.

Kilns: Design, Construction and Operation by Daniel Rhodes. Chilton Book Co., Radnor, Pa., 1968.

A Potter's Book by Bernard Leach. Transatlantic Arts Inc., Levittown, NY, 1976.

Stoneware and Porcelain: The Art of High-Fired Pottery by Daniel Rhodes. Chilton Book Co., Radnor, Pa., 1959.

Periodicals

Ceramics Monthly, Columbus, Ohio

Craft Horizons, New York

Courses

In the Philadelphia area:

Bucks County Community College, Swamp Rd., Newtown

Cheltenham Art Center, 439 Ashbourne Rd., Cheltenham

The Clay Studio, 24 S. Bank St.

Fleisher Art Memorial, 719 Catherine St.

Main Line Center of the Arts, Old Buck Rd. and Lancaster Ave., Haverford

Philadelphia College of Art, Broad and Spruce Sts.

Philadelphia Community College, 34 S. 11th St.

Tyler School of Art, Beech and Penrose Aves., Elkins Park

University City Arts League, 4226 Spruce St.

Wallingford Art Center, Plush Mill Rd., Wallingford

Elsewhere:

Haystack Mountain School of Crafts, Deer Isle, Maine

Lake Placid Center for the Arts, Lake Placid, N.Y.

Penland School of Crafts, Penland, N.C.

Peters Valley Craft School, Layton, N.J.

Long Beach Island Art Association, Loveladies, N.J.

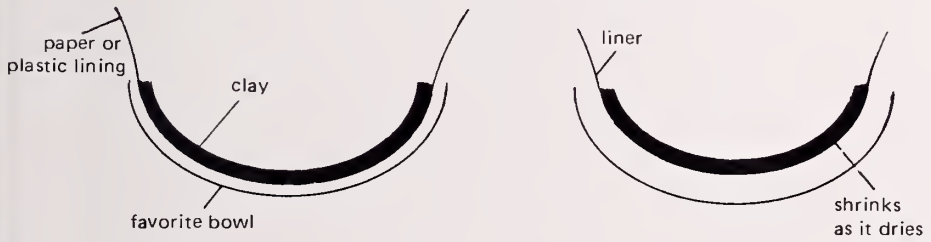
For an extensive list of summer courses, see the April or May issues of *Ceramics Monthly* and *Craft Horizons.*

Clay and kiln facilities are generally provided to students, with or without additional charge.

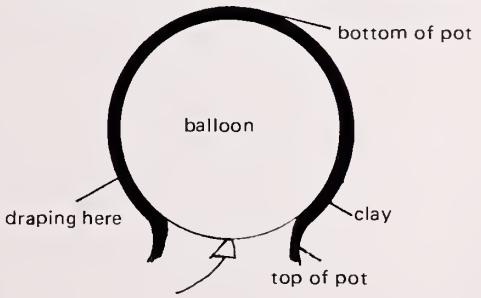
●

Ellen Miller is a city gardener, pottery student and has exhibited in the niche section of the Flower Show.

Making a container inside another container



Making a container outside of another container





In the Reflection Garden bright annuals share space with native ferns and wildflowers.

Leaming's Run Botanical Garden: One Gardener's Dream Come True

by Barbara Bruno

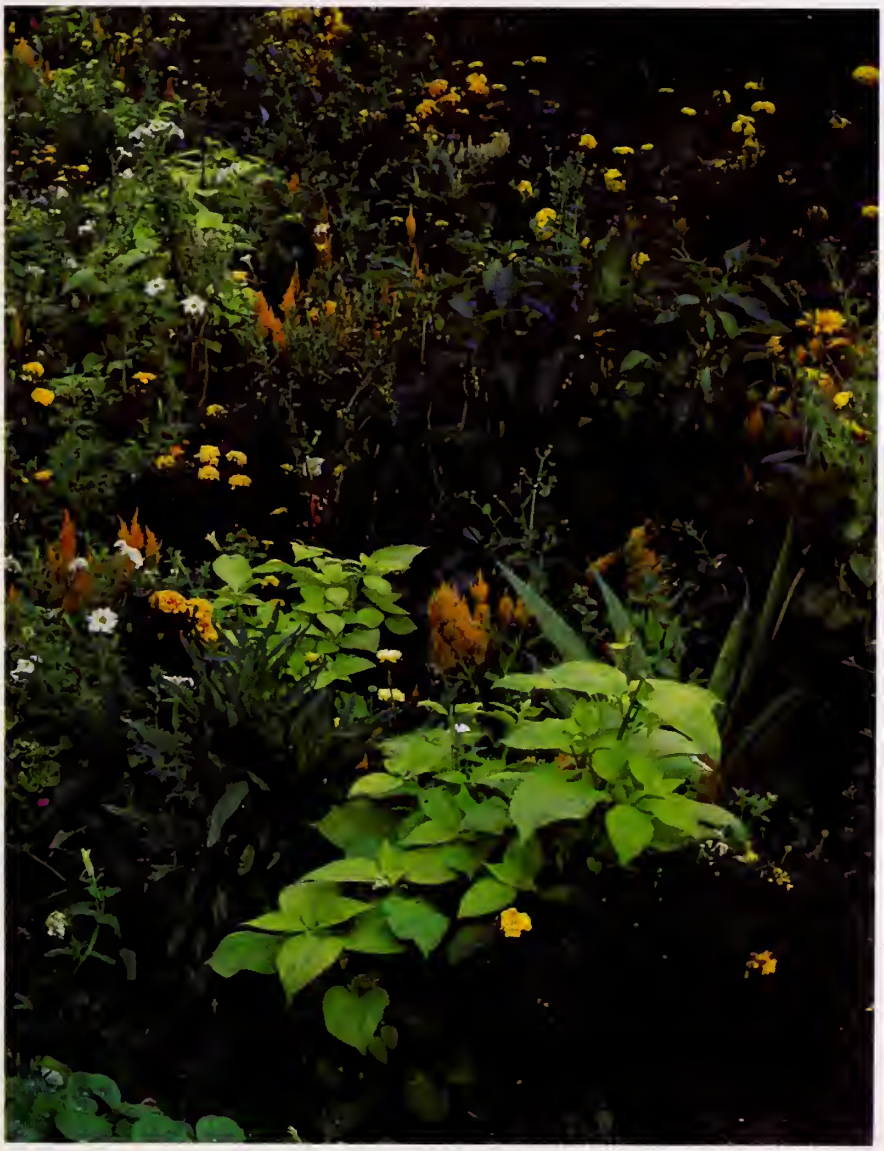
Barely two years old, Leaming's Run Botanical Garden is located on a 20-acre tract in the southern-most part of New Jersey. Visitors are offered an uncommon opportunity to enjoy the unique, sylvan atmosphere of a climax, coastal plain forest, along with the added attraction of colorful, pocket gardens strung like bright beads beside a pleasantly meandering path. Views of placid ponds, pools and gently flowing streams unexpectedly encountered among the gardens and serene woodlands present the traveler with a variety of scenes.

Jack April, the garden's architect and owner, as well as sole caretaker (assisted by his son), is not certain just when the idea of turning the lovely, wooded acres of his Cape May County property into a public garden first occurred to him. It might have been on one of the frequent walks with his wife that the germ of the idea was sown.

April is a thoughtful man with an avid interest in both gardening and the unique maritime climate and coastal plain vegetation that characterize the southern tip of the state. Husbanding the natural beauty of his 50 acres (20 acres devoted to the Botanical Garden and 30 are still in their natural, wild state) as best he could, he reluctantly foresaw the sale of at least part of the land when retirement made property taxes too large a burden. By creating Leaming's Run Botanical Garden he discerned a way to combine his love of gardening and natural history as well as preserving the land from the tourist-oriented development that has grown rampant in the area. He considers one of the prime purposes of the garden—as important as the enjoyment of the horticultural and natural beauty—to be the maintenance of a peaceful surrounding, a quiet spot for people to meditate in a world growing constantly more hectic.

Planning and planting the garden was a slow, reflective process involving countless thoughtful walks, quiet hours of deliberation, and five years of hard work done almost entirely by April himself. As the plan gradually crystallized in his mind it took the shape of a series of small flower gardens separated and surrounded by a fine example of coastal plain forest, lush with native huckleberries, hollys and ferns, canopied with ancient sweet gums, oaks and pines. Interesting natural features, such as the cinnamon fern bog garden were retained. The flower gardens, which now number 27 including small, incidental plantings, were placed in natural clearings for the most part. Burnt over areas were used as were sun pockets, discovered here and there. The placement of beds for the sun

continued



The Yellow Garden uses sharp parakeet green coleus as an harmonious contrast to golden hued blooms.

photos by Barbara Bruno

loving annuals, which are Jack April's favorites, was critical. He studied light angles in each clearing for a season before arranging the planting to gather maximum sunshine.

the water

By a happy chance, the delightful diversion of water was provided by Leaming's Run, named for the original colonial landowner. The run, a typical South Jersey brook of tea-colored cedar water, imbibes its tint on a leisurely passage through ancient cedar swamps. Transecting the property it becomes a central feature of the garden under the various guises of moss banked woodland stream, sluggish, curving "river," and sylvan pond, dark and unblinking, verdant with waterlilies.

The path is the backbone of the garden plan, holding all together. A delightful journey from garden to garden winding through refreshing, pine scented woodlands, it is a mile in length, and laid, as well as planned, by the gardener. It makes the garden one of the most comfortable to tour that I know of, being composed of gray white "Jersey" sand packed over spongy, woodland soil, as easy on the feet as padded carpet. Sun and shade alternate along the route, but at any time of day it is possible to find a shady bench nearby, placed to afford a lovely, peaceful, panoramic view.

One's enjoyment is further enhanced by the juxtaposition of deep forest with bright, manicured flower plots. The traveler is soothed and prepared for the next burst of color by passages of natural growth. These somber stretches cause the flower filled gardens to appear even brighter and fresher than expected. The path meanders in such a way that most gardens are viewed twice with the visitor often unaware of the return. One feels a surprise is always around the corner, such is the diversity of scenes created within the 20 acres. Leaming's Run is crossed and recrossed on a variety of rustic bridges, which add much to the garden's charm. Here a visitor sees the brook as a lowland marsh enfolded with thickets of fragrant, white pepper bush; at another point the view is of a broad curving expanse of sun-dappled stream rimmed in early September with the bloom of an encyclopedic collection of South Jersey's water loving wildflowers. Among them, the fluffy amethyst of joe-pye *(Eupatorium purpureum)*, the pristine, white blossoms of boneset *(Eupatorium perfoliatum)*, goldenrods in variety, and an abundance of the eyecatching spikes of scarlet cardinal flower *(Lobelia cardinalis)*, accompanied by cattails and moisture loving grasses—all reincarnated in a jewel-like brilliance on a black water looking glass.

the reflection garden

In the Reflection Garden the Run assumes the guise of a somber pond set in a forest glade, the water's edge softened by ferns and wildflowers. Lush grass spreads a carpet of soft green beneath the tall trees that ring the silent water and are drawn in shaded sameness on the dark, echoing surface. Water lilies and lotus ornamented the pond and then became a muskrat's gourmet dinner. Heron, elegantly white on slender legs, are sometimes seen in this spot only yards from bay side meadows. Mirrored in the black waters at dawn or dusk, they search for the darting gold of pond fish.

One of Jack April's aims was to make gardens that meant something to the average gardener. Plantings are kept small on a "backyard scale." Annuals predominate to supply the color needed from July through October, when the garden is open to the public, and, also because April feels many public gardens display plants difficult for the average gardener to find and grow. A few, specially selected perennials are started from seed each spring. In this way the gardener delays the bloom period to coincide with his needs in the garden. Other plants, such as chrysanthemums, are kept on hand in nursery beds to take the place of spent plants and to fill in bare spots. All-American winners are used whenever possible because of their superior performance, and flowers chosen for fragrance add their perfume to the swamp azaleas, magnolias and sweet pepper bushes native to the site.

Many of the gardens take a single color as their theme. The Yellow Garden, first on the tour, is designed to be a quiet garden and present a restful appearance to the visitor during all seasons. It is one of the most ambitious, using a large variety of plants for its effect including such unusual choices as canary peppers and yellow gourd vines trained to a rustic fence. The emerald green of a small, carefully manicured lawn bordering the curving, white sand path makes the yellows, whites and oranges appear even brighter, and in the autumn a background of huckleberries and sumac turn flaming



The Colonial Garden offers a no-nonsense collection of 18th century herbs and vegetables set in a woodland clearing.



Cardinal flower and boneset bloom together near the water.

red as a resplendent finale.

One of the most spectacular color gardens is the Red and Blue Garden. April has chosen a kaleidoscope of vividly tinted flowers, scarlet sage, flaming, plum-red celosia, claret red coleus, ageratum and royal blue lobelia. He fearlessly combines them with ornamental peppers of ruddy leaf and vibrant pod, glowing red-stemmed chard, burgundy leaved cabbage, and ruby lettuce. With a sorcerer's touch they have been transformed into a brilliant sight, not at all garish or jarring. In this garden dawn finds tops of half grown pines curtained in the heavenly blue of morning glories. In afternoon the dappled shade of surrounding tall trees soften the conflagration, and through foliage gaps the sinking sun touches now one border section, then another, with a dramatic solar spotlight.

the colonial garden

Approaching the Colonial Garden for the first time one has an eerie feeling of gliding back in time. Set in the deepest woods at the end of a quiet path, this garden seeks to portray with as much accuracy as possible the life of the first New Jersey settlers. It is a charmer, but not at all the geometric, clipped vision that the phrase "colonial garden" engenders. The inspiration for this reconstruction came from records of the Leamings, the original property owners, which showed they lived in the log cabin before a permanent house was constructed in 1730 (now occupied by the Aprils). A clearing was made in the woods; a cabin, built to resemble the authentic period log house still extant along the marshy reaches of the Delaware Bay, was constructed of the felled logs of cedar and oak. Thick split oak shingles form a watertight roof, and a brick, mud and twig fireplace and chimney were added along with simple period furnishings. Split rail fences enclose a dooryard garden and a small, stump strewn pasture. A charming, no-nonense collection of 18th century herbs and vegetables sprout in neat rows from the virgin, woodland soil, surrounding stumps and sometimes submerging them in a clambering, green tide.

April was skeptical as to how well things would grow, but then reasoned that if some things failed they probably would have done so for the early colonist as well, so authenticity would be preserved. For the most part the garden has been a success with vigorous growth and very little insect damage. No overly manicured planting here, but neatness and utility have a simple beauty that delights both eye and mind. The garden provides such a sense of satisfaction that one wishes to linger and quietly take in the essence of a time long vanished.

Since Jack April and his son maintain the garden on their own, somewhere along the way you'll find Jack, who will be only too glad to lay trowel or clippers aside to answer any questions you might have or to simply talk about Leaming's Run Botanical Garden. This garden, although highly personal and reflective of its creator is truly a garden with something for everyone. Those of us who garden with perennials can learn much from its atmosphere of serenity and calm. Landscape design will interest others, and for the gardener who revels in radiant color here is one man's dream—Leaming's Run Botanical Garden—to learn from.

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Ornamental asparagus

by V. F. and G. A. Elbert

At our house our favorite asparagus are the ones we eat. Splendid *A. domesticum,* which grows wild around the Mediterranean, is one such deluxe vegetable; its only fault is that the season is far too short. If you want to get acquainted with the wild stuff, you must go to Rome in the spring when bunches of very dark green, string-thin stalks, gathered in the surrounding hills, are a delicacy not to be missed. Our field grown asparagus is excellent, when it is not too coarse and thick. Belgium is famous for the blanched kind, but a tastier version, not exported in cans, is grown around the pretty town of Bassano de la Grappa, northeast of Vicenza, whose lovely wooden bridge was designed by Palladio. The short, white bunches are a gourmet's delight.

Edible asparagus plants possess all the essential characteristics of the ornamental ones. They have the stiff stalks with widely spaced, clasping true leaves that, in some species, turn into little thorns, and are liberally provided with branches on which grow myriads of thin, green needles that botanists, unable to classify them as either leaves or shoots, call cladophylls (Greek — leaf shoots). They are maverick members of the Lily Family as is proved by the little, white, six-tepaled, dangling flowers. One day, looking at a 30-ft. pole of a century plant inflorescence, we noticed for the first time how closely, with its spiralling, widely separated leaves, it resembled a young edible asparagus stalk. Though agaves are now separated from the Lily Family, it was good evidence of their close relationship.

Because the ornamental plants are commonly called asparagus ferns an astonishing number of people, who should know better, think they really are a kind of fern. All come from dryish regions of South Africa and tolerate normal neglect, accounting, along with a feathery appearance, for their moderate popularity as house plants. Two have been around for a long time.

A. plumosus of the shops (properly, *A. setaceus)* is the most delicate in appearance. But it is a very vigorous vine that easily covers a window trellis. Usually, however, it is kept cropped and grown in a pot. The stem is thin, tough, wiry and armed with rather sharp thorns—leaves that have been adapted to more lethal purposes. The branches are triangular and the cladophylls are finer than a hair. Needing little attention and quite decorative at times, it has one trait that is not endearing. In normal home conditions the cladophylls have a rather short life. When they start to shower down, frequent use of a brush and dustpan is called for. That explains, of course, why letting it grow into a vine is not recommended.

A. sprengeri (A. densiflorus cv. 'Sprengeri') is the familiar basket plant. Hanging is advisable because of the long, arching stems that bear much coarser cladophylls than plumosus. It is endowed with tubers and, therefore, drought resistant. But, as no one wants it to go dormant, it is usually watered regularly. That proves its undoing, for in fall and early winter the tubers start to rot with this treatment. Stems and cladophylls turn yellow and the latter soon fall off. This is a good example of a plant that nurserymen grow very easily and that quickly finds buyers in the shops. But we have yet to see a plant, not cared for by an expert, that looked its best for long indoors.

Cv. 'Myers' (there are several incorrect spellings in use) is a variety of more recent date than the others, at least in the States. It was in vogue awhile ago. Nobody could fail to be impressed with the large, showy, and expensive plants that appeared in the shops. The thick clump of upright stems is so covered with cladophylls tapering toward the top, that they look like fox tails.

We, too, succumbed to its attractions and have kept a plant for a number of years. It stays alive and produces quite a few branches, though these are

rather puny, short-lived and not numerous enough to make a good show. We suspect that it needs more light and humidity than we can supply. With memories of fine specimens we saw growing in Puerto Rico and at Alicante, in Spain, ours is a disappointment. Probably others have encountered similar problems, for one doesn't see as many 'Myers' around as formerly.

We should not overlook the fact that there are a considerable number of other asparagus ferns for the avid collector to search out at exotic nurseries. One or another of the species may yet turn out to prove a satisfactory house plant. Nor should we fail to mention the florists' smilax, which is no more a smilax than asparagus is a fern. It is called *A. asparagoides* and the so-called cladophylls make one doubt one's botanical sanity. They have all the appearance of normal leaves, being large, oval-pointed and dark green. In any event it is a messy grower, worthy only of cutting up for floral arrangements.

candidate for best asparagus fern — *A. myriocladus*

Our candidate for "Best Asparagus Fern" is *A. myriocladus,* which is probably no more than still another cultivar of *A. densiflorus.* It is a tuberous plant with only a few stalks growing at a time, which it produces with rather long intervals between. But these are up to two feet long with many side branches, thickly lined with tufts of cladophylls. Thus their diameters are much greater than those of the other plants. As the needles are blue-green and neither as coarse as those of 'Sprengeri' or as fine as *A. plumosus* they form a dense luminous cloud. And, though an undisciplined grower the plant is delicate and glowing, very bushy and with long-lasting needles. Most remain attached to the branch after they eventually turn brown. Nurserymen customarily trim a few inches from the tips of the branches in order to encourage new growth. We think that's a shame and spoils their shape. They are most beautiful when full blown.

We grow *A. myriocladus* in a sandy mix—about half peat moss and half gritty sand or perlite—which it seems to like. The tubers float in a cluster in the center of the pot but there are more of them invisible below the surface and at some distance to the sides. We prefer to water from the bottom, filling the saucer once a week in winter and twice in summer, in order to avoid soaking the tubers, which are quite capable of rotting. In semi-desert conditions the rains are infrequent and the plant draws its moisture over a long period from the subsoil as the liquid gradually rises to the surface. In this way, if we make a mistake in the frequency of our watering, damage is less likely to occur. Those who prefer to water less frequently can use standard peat moss, perlite and vermiculite as a 1-1-1 mix without too much risk. We fertilize with a low nitrate formula adding trace elements and iron chelate, which is also a concession to known desert conditions.

Because the foliage of *A. myriocladus* is so feathery its wide spread causes no space problem in an apartment crowded with plants. In our canon of ornamentals this is a "screening" plant—one that filters light, fits between others and casts interesting shadows especially at night. We treasure it and think it well worth your attention.

Plants are listed in exotic mail order catalogs and are available irregularly at nurseries and plant shops.



photos by George A. Elbert

Asparagus densiflorus 'Myers'

Books by George A. and Virginie F. Elbert

The House Plant Decorating Book, Dutton, N.Y., 1977

The Indoor Light Gardening Book, Crown Publishers, N.Y., 1973. (George A. Elbert only)

Plants That Really Bloom Indoors, Simon and Schuster, N.Y., 1974

Farm Journal's House Plants for Gift Giving, Philadelphia Farm Journal, Phila., Pa., 1978

Fun with Growing Herbs Indoors, Crown Publishers, N.Y., 1974

Fun with Growing Old and Curious House Plants, Crown Publishers, N.Y., 1975

Fun with Terrarium Gardening, Crown Publishers, N.Y., 1973

Grow A Plant Pet, Doubleday, Garden City, N.Y., 1977. (Virginie F. Elbert only)

The Miracle Houseplants: The Gesneriad Family, Crown Publishers, N.Y., 1976

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Virginie and George Elbert are frequent contributors to *Green Scene.*



putting the garden to

The garden has been a success again this year. In spite of insects, disease, and other invaders, we've had an abundant harvest. As fall begins, however, it seems to take weeks for the few remaining vegetables to reach a harvestable size. Flowers seem to be in a suspended state, with their colors gradually fading and their petals slow to fall. The gardener is no longer constantly weeding, spraying, fertilizing or mowing. Autumn will bring the crisp morning air, hues of red, orange and yellow, and surrealistic sunsets. It is a peaceful time of year as we unwind from the hectic gardening pace of summer. But the gardener is not finished yet. This is the time for thoroughness, for bringing the garden's cycle around full circle.

The one basic task shared by all gardeners this time of year is cleaning up. Taking away the fallen leaves and dead plant material removes the winter homes for insects and disease. After the debris is removed, a layer of peat moss, manure, or compost can be added to the garden and forked or tilled in. This addition improves soil tilth and exposes buried insects and disease to the jaws of winter.

In many cases, the largest harvest of the year is leaves, and they should be treated as such instead of being capsulized in plastic bags for the nearest landfill. A majority of the leaves can be ground up with the lawn mower right where they fall, particularly if the mower has a mulching attachment or is one of the new mulching mowers. This technique reduces raking, provides organic matter and increases the lawn's fertility. When leaf fall is too sudden or when leaves have been left to accumulate, they should be raked up and placed in a leaf composting pile. A chicken wire bin placed in an unimportant corner of the property will hold a good amount of leaves. This pile should be kept wet and sprinkled with 10-6-4 fertilizer occasionally to hasten decomposition. A simple device that aids in making this pile is the leaf-picker-upper, easily constructed from burlap and four 2 x 1's. (See photo and illustrations.)

frost

I tend to follow weather forecasts more closely now, and with the first frost warning my garden is shielded with old tablecloths, bedspreads, plastic paint tarps, and whatever it takes to keep the plants alive. Temporary tents are easily constructed over staked tomatoes and pole beans while a gentle touch is needed to blanket squash, peppers, eggplant and bush beans. Spinach, parsley, chives, cole crops (cabbage, cauliflower, broccoli, brussels sprouts, kohlrabi, etc.), beets, carrots and even some lettuces are half hardy and therefore can be left uncovered. This armoring of the garden is usually done by flashlight, of course, and I never realize

continued



photos by Howard J. Holden

Composted leaves

rest

by Howard J. Holden

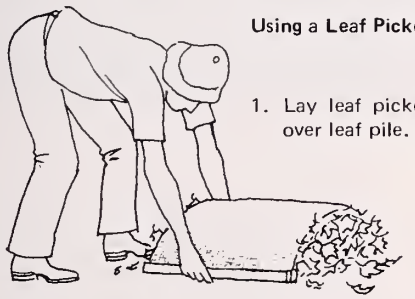


Mulching mowers reduce leaf raking.



Leaf picker-upper. See illustration for how it works.

Using a Leaf Picker Upper



1. Lay leaf picker upper over leaf pile.

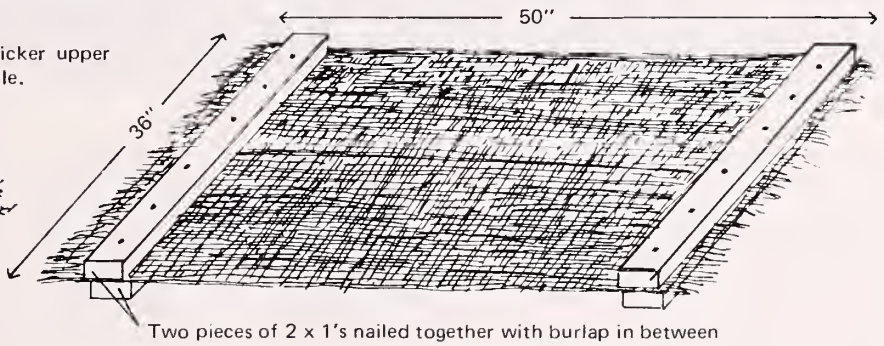


2. Push 2 x 1's under pile until they meet.



3. Encircle arms around the leaf picker upper tightly, pick up and carry.

The Leaf Picker Upper



Two pieces of 2 x 1's nailed together with burlap in between



Detail of a windscreen

the visual effect until my morning coffee, at which time the concoction is hastily removed. I also find it a good practice to have several boxes ready for the last big harvest before the killing frost.

A season seldom goes by that some disease, insect or rodent does not nearly convince the gardener to stop growing roses forever. If dead rose leaves and canes are not thoroughly removed now, chances are the insect or disease just may have the final say. As for the rodent, get a cat. After several hard frosts have occurred and all growth has ceased, apply a handful of bonemeal cultivate around each bush before hilling the soil eight inches around its base. Cut back the canes to three feet so they won't be whipped around in winter winds. Lastly, erect a burlap windscreen around bushes exposed to strong winds. This is done by first fastening chicken wire and then burlap to two-by-twos that have been hammered into the ground. The chicken wire helps keep the burlap from flapping in the breeze. Such a windscreen is also good for newly planted evergreens.

lawn

One facet of the garden that should receive attention in the fall is the lawn. The fall is the best time to seed because weed competition is reduced, moisture is usually plentiful, and temperature is favorable for rapid growth. The bluegrass, fescue and perennial rye mixtures are still thought to be best for this area. Fertilizing in fall will provide a green spring lawn without the constant mowing required with spring fertilizing. At this time of year a lawn thickens up naturally by sending out new runners, so fertilizers with 10-6-4 now vitalizes this process. Applications of lawn herbicides at this time effectively destroy weed seedlings that would winter over. And if grubs are browning out the lawn, this is the time to spread an insecticide (such as Diazinon) to bring their population under contol. Grubs hatch in the fall and eat the roots of the turf. As winter sets in, the grubs go deeper and the hungry moles tunnel after them. Applying Diazinon early in the fall should reduce the grub population and encourage the moles to go elsewhere for dinner. Keep mowing until the grass stops growing and go into winter with the grass about two inches in height.

The planting of evergreens and deciduous trees and shrubs can be done until the ground freezes. It's best to fertilize these in November. Any newly planted trees should be staked or guy wired and the trunks of young deciduous trees should be wrapped with tree wrap.

A bale of salt hay is a good fall investment. If the lawn is being renovated, a light sprinkling of salt hay will prevent seed and soil from washing away in the rain. A salt hay mulch is good for perennials. When applied after the ground is frozen, it will keep the soil frozen, thus keep the plants from heaving during alternate freezing and thawing. It also protects the precious little gems you've just planted or those whose hardiness is doubtful in our zone. In the vegetable garden, covering crops such as beets, carrots, leeks, and celeriac with salt hay before the ground freezes will keep the soil from freezing until really cold weather arrives, thereby prolonging their harvest time.

Once everything has been cleaned up, fertilized, planted, and covered, and the weather forces you inside, reflect upon your successes and failures in the garden, do a bit of research, and set your sights for spring.

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Howard Holden is superintendent/horticulturist of Chanticleer, a private estate. He received his degree in ornamental horticulture from Delaware Valley College of Science and Agriculture.

Ornamental Grasses for the Garden

by H. Peter Loewer



photos and art by author

Bulbous oats grass *(Arrhenatherum elatius bulbosum* 'Variegatum')

We began our country garden by clearing away a great deal of "farm rubbish"; not wonderful treasures from the nineteenth century, but a parade of broken cups, cracked pitchers, bottle shards, pottery chicken waterers in small pieces, innumerable bromo-seltzer bottles, aspirin tins, and endless blown fuses. As we cleared an area, beating back the encroaching forest, we cultivated and planted a perennial grass mix as a sort of green fertilizer to revitalize the wasted earth.

I then went through a period of what can best be described as manic grass cutting in a vain attempt to create a rolling lawn—the kind found on English estates—but soon realized that was pure folly: a complete waste of my time, my energy, and gas.

It was then I started to cloud cut, forming large patterns of grass by cutting once, twice, or sometimes three times a year with a sicklebar instead of a lawn mower—and from a distance the various levels of grass do look like billowing clouds. I became fascinated with grass: the shapes that individual stems made against the sky as they gracefully swayed in the gentlest of breezes, the wondrous variety found in their blooms, the beauty they brought to the garden when ornamental varieties were cultivated, the ease of maintenance, and finally, the winter bouquets dried grasses provide.

I now cut a tiny area of lawn; just enough to set off the herbaceous border and keep rabbits and woodchucks from sneaking unnoticed into the vegetable garden. And ornamental grasses now make up a major part of our flower garden. This article covers ten of my favorites: one annual type, grown for its flowers, and nine perennials for foliage and flowers.

perennial grasses

Bulbous oat grass, *Arrhenatherum elatius bulbosum* 'Variegatum,' has a white and green variegated leaf that grows in a clump from 8 to 18 in. tall. The name comes from the bulblike bottoms that are really swollen nodes on the stem. Each of these "bulbs" will produce another plant so you will always have plenty on hand. In addition, the "bulbs" store water for the plant, making it sturdy in the face of drought. This is a cool season grass and will

continued

Ornamental Grasses for the Garden continued



Reed grass, *Calamagrostis epigens*



Variegated orchard grass, *Dactylis glomerata* 'Variegata'



Striped eulalia grass, *Miscanthus sinensis* 'Variegatus'

make its best showing in spring and fall. Plants will take some shade but do their best in full sun and any reasonably fertile garden soil. The flowers are negligible.

Reed grass, *Calamagrostis epigens,* grows in a dense clump from 3 to 4 ft.. tall. It is a garden highlight from late spring when it flowers to early winter, when the dried flower heads wave in the January winds. The leaves make a rustling sound in the lightest breeze and it will grow well in either damp or dry soil, withstanding some degree of shade. After four or five years, the clump will become so thick it must be divided or the tightly-packed center will begin to die back.

Striped orchard grass, *Dactylis glomerata* 'Variegata,' forms a bunch of leaves between 1 and 2 ft. high. Orchard grass is a European import that now covers most of the United States and has some importance as a forage grass for cattle. Striped orchard grass is the variegated form and one of the most beautiful grasses around. The green is the green of limes and is an enchanting addition to any garden. Plants will eventually spread but are never weedy or pushy. The flowers are nice in a wild bouquet but nothing to write home about. This plant is also at its best in cool weather and does well in full sun or partial shade with any garden soil.

Many grasses flower with such precise timing that a watch could be set by their blooming habits.

Striped eulalia grass, *Miscanthus sinensis* 'Variegatus' grows between 4 and 6 ft. tall. *Miscanthus* is a genus of ornamental grasses represented by two species and many varieties extensively cultivated in gardens throughout the world. The graceful variegated leaves look their best when planted on a bank or slope giving them a green background to show their leaves against. I advise a winter mulch for this particular variety when your temperatures fall below 0°F for any length of time. The plant grows slowly and will never overtake your garden. The flowers are very attractive and well worth saving for winter bouquets. Any reasonably fertile soil will do.

Purple moor grass, *Molini caerulea* 'Variegata,' makes a handsome clump up to 2 ft. high. This is another plant that originally came from Europe and has naturalized in the eastern United States. The variegated foliage forms a neat, compact mound that is useful both in the floral border or the rock garden. It will gladly accept some shade and tolerate a bit of dampness. I've heard it said that *Molinia* will succeed



Switch grass, *Panicum virgatum*



Fountain grass, *Pennisetum alopecurodes*



Melic grass, *Melica altissima*

as a potted plant, but I've yet to give it a try. The flower spikes are too small to be of much interest in a winter bouquet, but on the plant they are a fountain of beauty: as the flower stems unfold, they, too, are variegated and give the impression that the spikelets have been banded with a brush of light yellow paint. A clump may go for many years without being divided.

Switch grass, *Panicum virgatum,* grows up to 6 ft. tall and is one of the most valuable native grasses of the prairies. While not entirely suited for the more formal perennial garden, it's a natural for a mass planting in a wild garden or when used as a screen to block out an unwanted subject. The open flowers are best viewed against a dark background. Switch grass will withstand poor drainage and flooding, growing with wet feet for weeks without visible discomfort. The flowers become a lovely tint of orange-brown in the fall and persist on the plant well into winter.

Melic grass, *Melica altissima,* can send its blooming stems up to 6 ft. high, when given full sun and a fertile soil. The individual flowers resemble grains of rice, each polished with a silky sheen that rustle together in the lightest of breezes. The arching leaves are attractive, but it is the flowers that give this particular grass its appeal. Plants are easily grown from seed or divided when large, and the dried flowers should be saved for dried bouquets. The plant pictured is but two years old and was grown from seed provided by the Alpine Garden Society of England.

Fountain grass, *Pennisetum alopecuroides,* forms a dense clump with leaves that arch out to a length of 4 ft. The self-contained mound of leaves would be a good enough reason to grow this particular grass but as the end of summer approaches, a better reason appears: large puffs of off-white to tan flowers appear on the ends of swaying stems; when covered with the morning dew and glistening in the autumn sun, these plants are stunning. As the nights grow colder, the leaves turn to a butterscotch-brown and persist all through the winter. The flowers do not last nearly as long: they are fragile and break up in the rough winds of autumn.

You should divide the plant every five to seven years as the clump becomes so thick that the center begins to die away. The best way to divide any thick clump of grass is with a sharp ax or shovel. Fountain grass, like most of the grasses, is not particular as to soil but does best in a position with full sun.

Reed meadow grass, *Glyceria aquatica variegata,* is a variegated form of a creeping grass that grows up to 3 ft. tall and favors a damp, even wet location. In England, this is a tall and lush grass

continued

Ornamental Grasses for the Garden continued



Annual foxtail millet *(Setaria italica)*



Manna grass *(Glyceria maxima* 'Variegata')

that grows along the banks of rivers in such thick and dense masses that the roots look like dry ground and a wet foot is the inevitable result of treading there. It is a graceful grass and the leaves with widths between 1 and 2 in. are heavily constructed and gently arch to the ground. This grass is also a determined creeper, and once established should be watched so that it never steps out of your determined grounds.

My original plant came from England—by air mail from Hillier's Nursery—carefully wrapped in sterile sphagnum moss and neatly sealed in clear plastic wrap. When the wrap was opened, an English ant walked out and dropped to American soil. It wandered off into the garden, and I've always hoped that it was well received by its yankee cousins.

annuals

The annual grasses, as a group, are rarely grown for their foliage, which, at best, looks weedy. But the flowers and seeds of the annuals offer so many fascinating varieties of form—and color—that one never ceases to admire these fascinating examples of nature's ingenuity.

A few of the annuals demand a prominent position in the garden bed and border, as the plants themselves are small and the flowers large but the best place for the group as a whole is the cutting garden. A good introduction is to choose a packet of the annual grass mixed seeds as sold by a number of the seed houses, including Stokes of Buffalo, and Parks.

When the wrap was opened, an English ant walked out and dropped to American soil. It wandered off into the garden, and I've always hoped that it was well received by its yankee cousins.

I note one annual though, as a worthy introduction to this tribe: foxtail millet, *Setaria italica.* This striking grass has flower heads that look like the foxtails that were tied on the rumble seats of old Chevies during the 30's. The dense panicles are often up to a foot long and bow toward the earth with the weight of the seed grains. While the plants tolerate some lack of water, they perish quickly under drought conditions. First grown in ancient China 2700 BC, foxtail reached Europe during the Middle Ages, and in 1849 entered the United States, where it became an important fodder crop. The seed is harvested for bird feed. The panicles are striking additions to the winter bouquet and last as long as you have patience to dust them.

As a general rule, the annual grasses require a position with full summer sun for adequate growth and flowering, but are not in the least fussy as to soil conditions. In order to have a sequence of bloom throughout the summer, I always start some seeds indoors in early spring.

The Structure of Grass

Grasses are very efficient and many of their structural characteristics contribute to their success as plants in nature, in lawns, and as garden subjects.

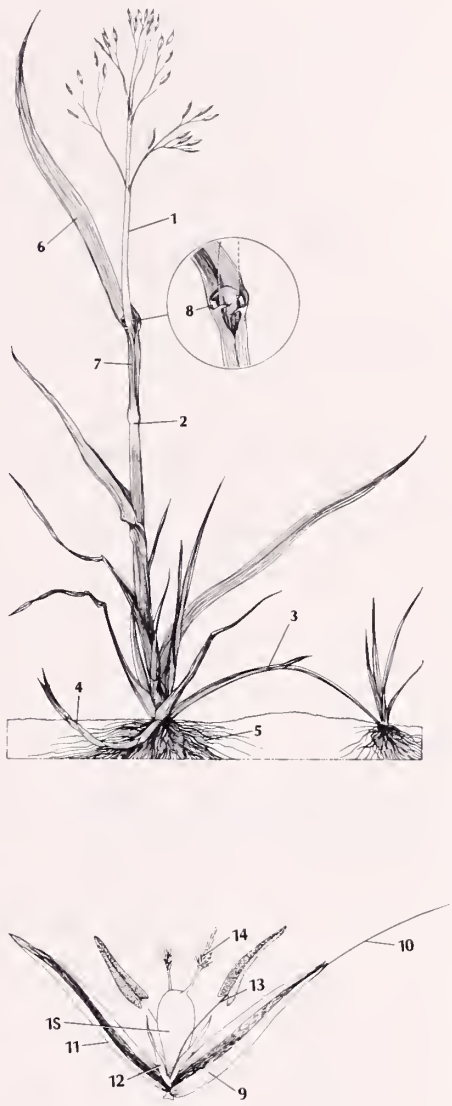
The **stems** or **culms** (1) are usually round and hollow (occasionally they have solid stems as corn or where a species must survive in an arid region). Stem sections are joined by solid joints or **nodes** (2). These stems may stand erect like the great fields of wheat or bend at the joints and trail along the ground like crab grass in which case the stems become **stolons** (3). When stolons continue to grow beneath the soil they are termed **rhizomes** (4), and rhizome growth is a method of reproduction that is almost as effective as seeding. This is well demonstrated by the abilit, of your lawn to spread—and unfortunately, includes the weedy grasses as well.

The **root systems** are very fibrous (5) and many types of grass send their roots down into the soil to great depths. It is this quality that makes grasses so valuable in erosion control and also prevents you from completely removing any unwanted grass without a good deal of hard digging. The great prairies of America were once covered with vast seas of grass that would burn to the ground every year in awesome fires, yet the deep-rooted plants would grow anew every year.

Leaves of grass are always parallel-veined and belong to the great group of plants known as monocotyledons, easily identified by grass seedlings that always begin with one seed leaf. A leaf consists of a **blade** (6) and a A few features, like petals, have all but disappeared, and the rest are so small that they must be seen with a magnifying glass. The **lemma** (9), which in turn gives rise to another major feature of grasses, the **awn** (10), the **palea** (11), and the **lodicule** (12) are all that remain of the petals of a typical flower. The **stamens** (13) are male and the **stigma** (14)—usually plumed to aid in picking pollen out of the air—is female and surmounts the **ovary** (15), where the seeds are produced.

Many grasses flower with such precise timing that a watch could be set by their blooming habits. The quaking oat grasses *(Briza* spp.*)* open about 6:00 am; the brome grasses *(Bromus* spp.*)* start to spill pollen at about 2:00 pm; and the oats *(Avena* spp.*)* open about 3:00 pm. The process begins when the lemma and palea start to open, allowing the anthers to spread and shake pollen on the wind; the feathery stigmas are now ready to receive pollen from other flowers. Grasses rarely self-fertilize as they are usually sterile to their own pollen. **sheath** (7) that surrounds the culm. Where the blade meets the sheath, a small hairy collar is usually found. This is termed a **ligule** (8) and is a distinguishing characteristic of grass (in English: "little tongue").

Since most of the grasses depend on the wind for pollination, they have no need for extensive and magnificent floral displays: garish petals and nectars attract bees, ants, beetles, and birds to do the job of pollination. The grasses cast their pollen out to float from flower to flower on gentle breezes, and the flower parts are essentially the same as other plants.



Some Sources of Ornamental Grasses

Herbst Brothers Seedsmen, Inc.
1000 N. Main Street
Brewster, New York 10509
Catalog that lists many annual and perennial ornamental grass seeds is free.

Garden Place
6780 Heisley Road
Mentor, Ohio 44060
Many plants offered in an excellent catalog, 50¢.

Kurt Bluemel
2543 Hess Road
Fallston, Maryland 21047
Large selection of over 30 ornamental grasses. List is 50¢.

Park Seed Company
Greenwood, South Carolina 29647
Free catalog lists many types of grass seeds.

Thompson & Morgan
P.O. Box 24
401 Kennedy Boulevard
Somderdale, New Jersey 08083
Catalog is free and lists a large number of grass seeds.

Wayside Gardens
Hodges, South Carolina 29695
Catalog is $1.00 and lists many ornamental grass plants.

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Peter Loewer is a botanical artist and scientific illustrator who writes and illustrates his own books. He lives near the Upper Delaware River and also edits a small upstate New York newspaper. His book, *Growing and Decorating with Grasses* (Walker, 1977), is a June selection of the American Garden Guild Book Club.

Rooting Rhododendron Cuttings with Sugar Dip · · · An Experiment

by Don Gordner

Don Gordner of Gordner's Nursery in Kent, Washington wrote a piece for the Rhododendron Society Newsletter *in November 1979 about dipping hardwood cuttings in sugar for successful rooting. After we wrote and got permission to reprint from Gordner, he included two addendum. The first was another piece of advice from a western colleague, Ted Van Veen of Portland. Van Veen said his father began propagating rhododendrons before the discovery of indole-butyric acid: at that time he used a mixture of molasses and honey and it seemed to work quite well. The second point Gordner made was that the next experiment they did with the sugar dip was with softwood cuttings. We've included his comparison between softwood and hardwood cutting survival. He concludes strongly that the softwood cuttings do not do as well as the hardwood with the sugar dip. See for yourself.*



In reading articles written by others about the things that apparently govern the success or failure in rooting cuttings of woody plants, I came across the statement that it is probably the high content of carbohydrates in the sap of the cuttings when taken that dictates the percentage of success in rooting. Working on this basis in the fall and winter of 1975 and 1976 I began experimenting with dipping cuttings in a saturated solution of refined white cane sugar in water. This was done after the cuttings were prepared for the rooting bench and before the usual fungicide treatment with Captan, followed with dipping in a one-to-one solution of Dip and Grow. The prepared cuttings were soaked in the sugar solution for a minimum period of five minutes. I did not use the separate cuttings at that time as a control to check the results against but as I was getting much better than the usually expected results with the experimental cuttings, I did use control groups last fall and winter (1979).

Hardwood Cuttings (Matured Wood)

Variety	Treated	Results of Treated	Untreated	Results of Untreated
Crest	23	23 rooted	23	9 died none rooted
Purple Splendor	55	55 rooted	40	18 died 2 rooted 20 removed
Stephanie	46	43 rooted 3 died	46 46	3 died none rooted
Black Sport	13	13 rooted	12	none rooted

softwood cuttings

This series of experiments was undertaken to determine whether the same results reported earlier might be obtained when the concentrated sugar solution was used on much softer cuttings than those used in the reported experiments. From the following it is obvious that there is a great difference in results between the use of a strong carbohydrate solution on *hard* cuttings and on *soft* cuttings.

Softwood Cuttings (Just Woody Enough for Cuttings)

	Variety Used	Date Taken	Date Checked	Rooted Fully	Partial	Not Rooted	Dead	
43	Unnamed Yellow	7-21	11-18	2			41	Sugar
42	Unnamed Yellow	7-21	11-18	16		26		
21	Unnamed Yellow	7-21	11-18	1			20	Sugar
20	Unnamed Yellow	7-21	11-18	9		8	3	
72	YM11	7-21	11-18				72	Sugar
70	YM11	7-21	11-18	40		21	9	
86	Idealist	7-21	11-18	46		9	31	Sugar
80	Idealist	7-21	11-18	61		13	6	
92	YM1	7-21	11-18	9		12	71	Sugar
90	YM1	7-21	11-18	26		46	18	
66	Royal Pink	7-21	11-18				66	Sugar
64	Royal Pink	7-21	11-18	52	10	2		
56	Evening Glow	7-20	12-1	21		10	26	Sugar
57	Evening Glow	7-20	12-1	31		4	21	
34	Wonderful One	7-21	11-15	33			1	Sugar
32	Wonderful One	7-21	11-15	31		1		
48	YM21	7-21	11-15	31		12	5	Sugar
45	YM21	7-21	11-15	39		5	1	
43	YM27	7-22	11-15	23			20	Sugar
49	YM27	7-22	11-15	27	16		6	
165	Unique	7-23	12-1	60	49		56	Sugar
164	Unique	7-23	12-1	89	31		24	
49	Gretzel	7-29	12-1	35		9	5	Sugar
49	Gretzel	7-29	12-1	39		5	5	
97	Golden Belle	7-29	12-1	34			63	Sugar
94	Golden Belle	7-29	12-1	63		11	30	

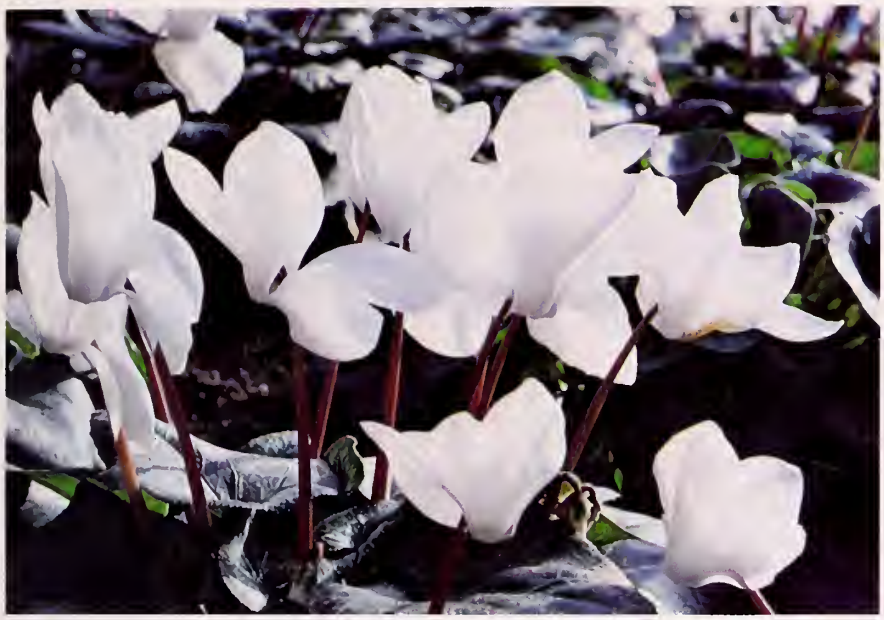


photo by Dick Keen

Cyclamen persicum

CARING FOR CYCLAMENS: A DIFFERENCE OF OPINION

by Adelaide C. Rackemann

I consider cyclamen *(Cyclamen persicum)* one of the hardest house plants to grow. This beautiful native of Greece and Syria, with heart-shaped, silver-marbled, single leaves, and proud flowers with large, curving petals, in shades of pink, rose or white, is a member of the primrose family and a florist's favorite. I know someone who is periodically sent a lovely cyclamen, and every time it appears she groans because she knows she will unwittingly kill it.

One reason for the difficulty in keeping cyclamens, and for my friend's periodic despair, is that the advice given on cyclamen care is often conflicting and therefore confusing. I discovered that confusion when presented with a cyclamen last fall. Having killed a few plants of my own in the past, I was determined to take care of this one, and to have it survive the long winter. My objective was simply to have a healthy plant, full of continuous bloom. So I consulted several books on house plants.

While most books agree that cyclamen needs a cool temperature (45° to 50°F. at night and no more than a 10° increase in the daytime), occasionally you will find this statement: "Cyclamen should be kept at a medium temperature (60° to 70°) in an atmosphere of maximum humidity" (*New Era Modern Guide to House Plants,* Ann Warren, New Era Books, 1961, page 78). The author also mentions, by the way, that cyclamen is difficult to grow. Little wonder! If one follows her advice, the result is apt to be fatal to the poor cyclamen.

humidity, water and light

The matter of humidity is not disputed, in principle, although the level of humidity may be crucial. I have never read of any plant—except cactus—that does not require some humidity. If one did keep a cyclamen in a room of 70°—much too hot anyway in these days of energy saving—there would be a greater need for added humidity, obviously. In a room of 55°, the problem will not be grave, although it may be well to set the plant in a saucer of pebbles, as many experts advise, including Stanley Schuler, in *1001 House Plant Questions Answered* (Van Nostrand, 1963, page 125), "with water just to the surface of the pebbles."

Almost everyone seems to agree that cyclamen should be watered from the bottom, to avoid crown rot, to which cyclamen is susceptible. Contradictory advice here has to do with the temperature of the water. Some books, including *New Era Modern Guide to House Plants,* say to use warm water and even suggest boiling water. Many books do not mention water temperature, but some do recommend water of room temperature. In the case of cyclamen, room temperature means 60°, provided you water during the day—the approved time for watering any plant—and 60°, needless to say, is a far cry from 212°.

How much to water seems to be a matter of opinion, too. While most authorities caution that the soil should not be soggy, they do not all agree that the plant should be completely dry before watering. They do not, in fact, really come to terms with the degree of moisture that should be retained in the cyclamen's soil. Again, if the cyclamen is in a room of 60°, it will not need as much watering as it would in a warmer room. Still, the vagueness on this subject is cause for uneasiness—especially for people who don't have much success with their house plants.

The matter of light for cyclamen is a subject shrouded in some mystery. "Filtered sun but good light," says Jean Hershey, in her concise and always sensible *The Woman's Day Book of House Plants* (Simon & Schuster, 1965, page 51). Schuler suggests a north window, if you have just received a cyclamen from the florist and want to prolong the blooming period. For those growing their own cyclamen plants, however, he recommends an east window. The best environment is "well-lit, well-aired," according to *Simon & Schuster's Complete Guide to Plants and Flowers,* edited by Frances Perry (1974, page 44). No mention is made of temperature in this guide, and watering is to be done sparingly.

Those offering advice on house plant care are in accord on some things: avoid drafts and avoid radiators. These admonitions, important for most plants, apply particularly to cyclamen. Don't put your plant on top of the TV set, either.

Although some of the books do not mention pests attacking cyclamen, others have much to say about the cyclamen mite, which makes itself

continued

known by distorting the buds and flowers. Donald Wyman notes: "Infested plants seldom produce many normal flowers. Mites live under the bud scales where they are difficult to contact with insecticides. . ." (*Wyman's Gardening Encyclopedia,* Macmillan, 1971, page 286). He also mentions a significant fact: while cyclamen has no serious diseases, "continued high humidity may induce leaf spot or gray rot of the tuber." So much for the high humidity many other authors urge for the cyclamen.

Seeking information about cyclamen care, I found some differing views about the wisdom of keeping a plant after it had finished blooming. (While

I did not water it at all until two weeks after I had first received the plant.

Jean Hershey optimistically says: "Your Christmas plant will bloom until April if grown in good light, in a cool spot, and watered properly," other authorities give us no more than three months for our cyclamen to bloom—"with the proper care," of course.)

Some authorities simply suggest tossing out the corm—which most of them call a tuber, and some, incorrectly, call a bulb—and the more adventurous tell us to keep it. After the blooming period, the plant is allowed to die back. Schuler instructs us: "put the tuber in its pot in a shaded place outdoors and water only about twice a month. In July or August, repot, increase water, and keep in a light (but not sunny), cool place. If you don't get vigorous growth within four to six weeks, throw the tuber away." *The Wise Garden Encyclopedia* (Grosset & Dunlap, 1970, page 357) mentions that the plants "require abundant light but some shading on hot summer days." *The Wise Garden Encyclopedia,* by the way, has much more to say about diseases of cyclamen than does Wyman, and mentions some additional insect pests as well, such as nematodes that may cause "knotty growths or galls on the roots," and black vine weevil, which may chew the roots.

Cyclamens can be grown from seed, beginning in the summer, using sterilized soil—which most agree should be a mixture of loam, leaf mold and sand—but it takes year and a half to get a bloom, after a number of repottings and gradual enrichment of the potting soil.

Having gleaned all of this information from a variety of sources, many of them conflicting, I was not encouraged when presented with my own striking pink flowered plant. In fact my main feeling was one of great trepidation. Remembering my past failures, however, I decided that the cyclamen, whatever else it required, did need a cool place.

Cautiously, I placed it in the coolest spot in the house: on a table in a nook next to our attached greenhouse—a cool one, of 50°F.—and between two glass doors. Thus the plant receives light—indirect sun—from three sides.

Satisfied that the temperature and light were what the cyclamen required, my next concern was watering. Since overwatering is so often the cause of a house plant's demise, I reasoned that my own cyclamens of the past had probably been overwatered. Indeed, I vaguely recalled having seen some suspiciously yellow leaves. So this time I was determined not to overwater.

Instead, I periodically thrust an index finger into the soil. For nearly two weeks, I found that the soil was still moist. While it was all I could do to restrain myself, I did not water it at all for two weeks after I had first received the plant. Although our florist had said to water the plant from the top—against all the advice I had read—I decided to water from the bottom. Using an old dishpan filled with room-temperature water—less than 60°F.—I placed the pot carefully in its tub, making sure no water touched the leaves. I left the cyclamen soaking for about half an hour, removing it when the surface of the soil was damp. This process has been repeated ever since. Occasionally, when the flowers look droopy, I have let only 10 days pass before watering.

Since both the kitchen and the adjoining greenhouse are reasonably humid, I have not added any humidity. During the past four months, I have fertilized the cyclamen only twice, and frankly it seems to have made no difference; the plant is thriving, but perhaps it would be thriving anyway without the fertilizer. While bright flowers tower over the thick leaves, new buds wait under the canopy of foliage, periodically making their way to the top. The florist advised removing the old flowers, something I had not read in any book, and so I have picked them off, stem and all. New flowers keep appearing.

In fact, having nurtured this plant for over four months and having it look as beautiful today as it looked upon its arrival, I feel more confident about cyclamen care and am even prepared to say—based on this unusually happy experience—just what the plant really needs.

A cool location is apparently ideal. Good air circulation and lots of indirect light obviously help it. Infrequent watering, from the bottom, without wetting the leaves, but thoroughly soaking the soil, seems to work well. An occasional fertilizing certainly does it no harm, and neither does picking off the dead blooms.

All of this may sound easy, but I learned the hard way. The care my plant receives is based on a sifting of several different house plant authorities. Had I merely looked at one book—if it had been the *wrong* book—my cyclamen would probably not have survived.

One thing apparent from reading the different sources is simply that while they may disagree on certain points, and while each adds a new, interesting bit of information, all acknowledge that cyclamen is a real challenge.

Books

New Era Modern Guide to House Plants, Ann Warren, New Era Books, 1961.

1001 House Plant Questions Answered, Stanley Schuler, Van Nostrand, Princeton, N.J., 1963.

Simon & Schuster's Complete Guide to Plants & Flowers, Francis Perry, Simon & Schuster, N.Y., 1974.

The Wise Garden Encyclopedia, Grossett & Dunlap, N.Y., 1970.

The Woman's Day Book of House Plants, Jean Hershey, Simon & Schuster, N.Y., 1965.

Wyman's Gardening Encyclopedia, Donald Wyman, Macmillan, N.Y., 1971.

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Adelaide C. Rackemann has written book reviews for the *Baltimore Sun* papers for years and writes articles for magazines and newspapers. She serves on the board of the Horticultural Society of Maryland and the Cylburn Wildflower Preserve and Garden Center in Baltimore. She is a graduate of Wellesley College and has a B.S. from Columbia University School of Library Science.

LETTERS

Weeding Brick Walks

Dear Editor:

Having weeded many a brick walk and terrace, I feel for those at Wyck ["Summering Houseplants under the Grape Arbor at Wyck," Green Scene, *May 1980], I hope this tip from the* Garden Club of America Bulletin *will help eliminate chemicals and tedious digging.*

Heat water in a tea kettle and pour on weeds and grass. In four or five days they should die and can be swept away with a broom. The boiling water treatment may have to be repeated once or twice for such persistent weeds as dandelion but it does get the roots without disturbing the bricks. Our grape vines have not been harmed. I suggest testing on a small patch first.

Sincerely,
Virginia Layton Orr
Lewes, Delaware

Be Careful with Comfrey

Dear Editor:

RE: "The Comforts of Comfrey" (March 1980, Green Scene*)*

Enclosed is a page from the Herb Grower Magazine *(Vol. XXXIII, No. 1, 1980) which deals with the dangers of Comfrey as an internal food or medicine plant.*

Over the years we have published similar articles to the one by Jan Riemer, but never in quite such a specific form, never using Jethro Kloss as an authority, never connecting it with curing cancer.

Recent experiments show that Comfrey contains an alkaloid pyrrolizidine which is in question for its safety. Of course, potatoes and tomatoes contain solanine which can also be harmful. So at present it is considered wise to restrict Comfrey to external use only. That is the way it was used for centuries and only in this century has it been advocated as a tea or food for ulcers, etc., because of the allantoin it contains.

In my book Herbs for Every Garden *I described the use of Comfrey for animal fodder in California in the 1960's and it has been thus employed worldwide. No record of animal poisoning could be found in a computer check of the herb in England. But anything in excess can be bad.*

Gertrude B. Foster
Editor

Reprint from *Herb Grower Magazine*

What About Comfrey?

In Volume XXXI, No. 4, page 89, there was the mention of research in Japan which cast a serious doubt about the safety of Comfrey for animals and humans. We have waited for further information from The Henry Doubleday Research Association, whose founder repeated a warning made by Dr. C. C. J. Culvenor of Australia, who is a world authority on pyrrolizidine alkaloids. Comfrey and other members of the Borage family contain pyrrolidizine alkaloids.

In the British *Herbal Review,* Winter 1980, Mr. Hills sums up the situation up to now. We summarize as briefly as possible: Research in Japan which fed rats a third of their diet as "fresh Comfrey causing them to develop liver cancers" is what led up to the warning. Since then the Association was able to establish that Comfrey ointment is not dangerous, through Dr. D. G. Crout of the Exeter University, a British expert on alkaloids. The HDRA warned against the consumption of Comfrey as they warn against any substance that causes cancer in rats. Instead of duplicating existing laboratory tests, they are gathering data from the experiences of Comfrey users. In Australia there is work which will take two years being done on the alkaloids in the herb. There are a large number of people in Australia who belong to HDRA. Their use of Comfrey as animal feed and its human consumption is being recorded with a medical check of those members there who wish to take part in the study by the national program for health. This arrangement has been the result of Dr. Culvenor's efforts. In Britain, the HDRA has been working with the Liverpool Polytechnic School of Pharmacy and the Medical Research Council on methods of breaking down a dangerous alkaloid by drying the herb, towards finding the period when the alkaloid is lowest and would make a safe harvest for herb tea. In young leafy tips it seems to be highest.

There are encouraging letters from a professional body of British practitioners in the spring issue, 1979 *Herbal Review,* which takes a position that human metabolism can't be compared to that of rats. Mr. Hills has had help in Britain from the Commonwealth Bureau of Animal Health. A computer search through 137,000 references in their files since 1972 found but a single poisoning case from Comfrey. This was in Germany where swine died after feeding on a species of Comfrey, but not from the alkaloids in it. It was nitrite-nitrate poisoning, from nitrogenous fertilizers.

All the ways in which Comfrey helps add a number of minerals to the soil, when used for compost or green manure are considered safe. A comparison of the toxicity of Comfrey with the many of our common foods, such as potatoes and tomatoes, containing solanin in different degrees and parts of the plants doesn't help the study at present. Headlines "Comfrey is clear of suspicion" will not help to ease the worry of those who have made Comfrey tea a constant beverage. But it is comforting to know that at the moment dedicated people, such as Mr. Hills, are working on statistics from those who have had no problems from it. It is possible that a history of use for human consumption which has piled up over centuries may weigh more heavily than laboratory experiments.

growing interests



persea americana

When we moved into our present house we converted a screened porch (facing south and west) into our "green room" by enclosing it with double-walled translucent plastic panelling.

We now have a light transmission of about 78%. Our avocado tree *(P. americana)* is in a 16-ft. diameter cedar container, planted in organic soil from our vegetable garden over a base of beach pebbles in the bottom. There is a good circulation of warm air in the green room during the day, with temperatures on a cold winter night sometimes dropping to 45°F.

Our avocado grew up in this environment, spending the summers out of doors in the full sun for half a day, in filtered sunlight for the rest of the day. However, for the past two years, because of its size, the avocado has wintered under fluorescent light in the lobby of my office where it lives in an atmosphere of tobacco smoke and lots of care. The daytime temperature is 68°F, and 55° at night. It is soaked when the leaves begin to droop.

When I first spotted something growing on the plant, it looked like a small cluster of grapes. As it grew, it became apparent that this was truly becoming a blossom and I could hardly contain my excitement. I called several of my horticultural friends. No one really believed me at first, but Ed Lindemann of PHS put me in touch with Patrick Nutt of Longwood Gardens, who came to inspect the tree.

He told me that the chances of my tree producing fruit are one in 5,000. The average container-grown avocado seems to live five to seven years. But my 15-year-old tree bloomed this year, and who knows—with the help of pollen from a commercial grower and a bee or two next year—fruit?

Herbert E. Gullberg

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Herbert E. Gullberg gardens in Moylan.

hoya carnosa

I've had my hoya plant for 12 years. A friend gave me a slip and it grew into a nice vine with large oval-shaped leathery leaves that have a waxy appearance. Hence the name often given it—"wax plant."

For four years it grew around a big window with a western exposure but then, after a long wait, the lovely large umbels of star-shaped, flesh-colored flowers with red centers appeared periodically. The umbels are three or more inches wide and have a porcelain appearance. At one time there were eight blooms in various stages. It is most interesting to watch the pink buds unfold into star-shaped, white flowers that have a furry appearance—they remind me of polar bears.

Hoyas don't do well when moved or disturbed in any way. So when we had to move, I felt sure it would disturb its blooming. I made a circle with a wire coat hanger and wrapped the vine around it and have left it that way. However, three years after we moved, when I had just about given up hope, four lovely blooms appeared and since that time it has bloomed four times, with the flowers coming on the same flower stalk each time. So I suggest that you not break off the stem after it blooms.

You need patience to wait for a hoya plant to bloom but it is always worthwhile when the beautiful umbels appear.

E. Marjorie Powell

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E. Marjorie Powell enjoys working in her garden, hiking and taking photographs, especially of wildflowers.



melissa officinalis

Melissa, lemon balm, improves the growth and flavor of all nearby plants, as yarrow strengthens the aroma and growth of other herbs close by. Grow melissa among your leeks, close to your tomatoes and French parsley.

Melissa is one of the first perennials to appear in early spring, and in late November it remains green and leafy even after two or three light frosts. A drop into the twenties, say about December 3, and the beautiful compact herb is finished for the year.

The longer the days, the larger its leaves become, and during spring, summer and mid-fall, you can cut up to six entire branches from a plant and two days later the melissa is as bushy as ever. This pruning, often three times a week, appears to encourage the melissa, which has a spreading habit; it grows outward so that a healthy plant is wider than tall. Our plants rarely exceed one foot, except for width.

Where horizontal branches touch the ground and remain, roots form. We have found it unwise to cut this branch too soon; the new plant's leaves are off-color and small for about two weeks.

Bees love the fragrance of melissa, and some beekeepers plant the herb near the hives to lure their bees back to the hives. And they rub melissa inside new hives so the bees will settle more easily in their new homes. "Melissa, grown among your vegetables and fruit trees, attracts bees from miles around to pollinate your crops," says Dorothy Hall, British herb expert.

For centuries melissa was called the scholar's herb; tea brewed from its leaves was given to students preparing for examinations; the herb was thought to improve memory and concentration and sharpen the wits. The tea was prepared by pouring one cup of boiling water over one ounce of fresh leaves and letting them steep for five minutes or longer.

A melissa plant stands temperatures down to 20 below zero with little protection, while a rosemary nearby, under mounded earth and a winter mulch, does not survive a drop to 10° above. Melissa is one of the first plants to appear in the spring—as early as French parsley. Light frosts do not bother it, so it can be the last plant potted and brought inside on an unusually warm November afternoon. (On November 5, 6 and 7, 1978, the temperature reached 73.)

The herb thrives in a sunny window under a pebble mulch to keep the soil surface from drying too fast. In the average 70° room a melissa may need to be watered four times a week. preferably with room temperature rain water. And it can be set outside during warm rains, when the temperature is above 59° to be washed and refreshed. No indoor plant benefits more from a clamshell nestled amongst the mulch pebbles and kept full of water to provide humidity. Even if the melissa is kept above the kitchen sink between the fire fern and the *Aloe vera,* the shell becomes dry within 24 hours and must be filled daily.

Melissa was long known as the elixir of life; it was taken to strengthen the heart and ward off the physical effects of age. Long ago, Arabian doctors recognized the herb' great calming, soothing and healing qualities. More recently, it has been used to darken white hair safely. Melissa oil is one of the essential aromatic oils used to scent perfumes, candles, stationery, ointments and liniments; it is $5.50 an ounce.

Devon Reay

●

Devon Reay is a frequent contributor to *Green Scene.*

continued







beaucarnea recurvata

I picked up a miserable little plant of questionable viability in Woolworth's for 59 cents. It joined my other potted house plants.

It's called *Beaucarnea recurvata* and while it is related to the yuccas, it is included in the Liliaceae family. Common names are bottle palm, pony tail, and elephant foot tree.

When you see this plant you will easily conclude why it is called by these names. The plant does have a certain charm, and the graceful appearance of a well proportioned bottle. Its bark has the grayish-brown color and wrinkled texture of an elephant's foot.

The beaucarnea is distinguished by a bulbous swelling of the trunk, at soil level, in which water is stored for future use. This characteristic feature is useful for the plant's survival in its native Mexico where droughts occur. The top of the trunk is then crowned with a pendulous tuft of dark green grass-like, stiff leaves. In its natural habitat the pony tail, at maturity, can reach 30 ft. high, with leaves approximately 4 ft. long and three-quarters of an inch wide.

In May of 1976 my newly acquired plant was just 4 in. tall, and boasted a swollen trunk only ½ in. in diameter. Now, four years later it is a foot tall with the bulbous trunk measuring 3½ in. across. There are 30 strap-like leaves, some being 26 in. long, but all gracefully arching and tumbling down from the top of the trunk.

Beaucarnea is a rewarding plant to have. It never needs pruning, and on its own, keeps its neat, attractive appearance. Plant diseases and pests are never a threat, and short periods of neglect are easily overcome. Coming as it does from a subtropical climate, the plant thrives in our comfortably heated homes during the winter. Plants can remain in their container three or four years before repotting in ordinary, packaged house plant soil.

My own plant is in a 4-in. pot, which then allows one quarter inch of space between the bulb and the pot rim. It is on a plant stand about one foot away from a window that gets sun all afternoon. I water it about once a week with a weak fish fertilizer solution (one tablespoon to a gallon of water). Some growers recommend full strength feedings twice a year, but others say a weaker solution is more beneficial. All of my plants respond well to this treatment.

My 59-cent investment now seems to have a built-in guarantee of many years of pleasure and enjoyment.

Hilda Weber

●

Hilda Weber came by her love for house plants as a child, when she was growing up on a farm. She notes she spent all of her money for plants back then, and still does. She has won a first prize for an individual garden in the PHS City Gardening contest.

the plant finder

A new service for *Green Scene* readers



WANTED

Seed of *Bellis perennis* (Dresden China)
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***Pyrus salicifolia* 'Pendula'**
Contact: Mrs. W. C. Bodine, 617 Harriton Road, Bryn Mawr, Pa. 19010

▼

If you've been looking through the usual sources for a hard to find plant and have come up with nothing, let us help you. We will publish a "want list" in each issue. Send your name and address (include zip), the botanical name of the plant and if you wish, the common name. Send to Plant Finder, Green Scene, PHS, 325 Walnut St., Philadelphia, Pa. 19103. People who have the plants or seeds that you want will contact you to make arrangements about selling them or giving them away, mailing, etc.

classified ads

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In the Red and Blue Garden a kaleidoscope of vividly tinted flowers are used. See story on page 14.



THE green scene

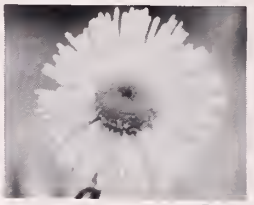
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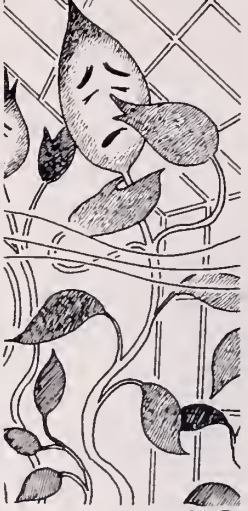
an autumn garden

See page 4









THE green scene

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Front Cover: The golden remnants of morning fog illuminate the silver lamb's ears and a gleaming clump of *Allium tuberosum* in the foreground.
photo by Barbara Bruno

Back Cover: photo by Edmund B. Gilchrist, Jr.

PHS ~ 1980

Looking back can be helpful. It reminds us of the changes we have dealt with in the past and gives us confidence in our ability to meet the challenges of the future.

Even so short a time as 20 years has seen our Society change almost beyond recognition. Two decades ago the strength of our membership consisted of affluent suburbanites with gardeners to do most of the work on their ample estates. Membership in the Society entitled one to little more than a ticket to the Flower Show, a subscription to *Horticulture* and spring and fall garden visits. If you wanted to participate in the Show, you could enter a flower arrangement, or join a garden club and help build a competitive garden, a room section or a table setting.

Today our membership is as broad as the Delaware Valley. Our members can involve themselves in any number of activities. More than 1,500 of you work on the shows. The horticultural classes, non-existent until 1958, attract more than 1,000 entries. The library, which used to be little more than an archive, is now a center of inquiry and research. We have Philadelphia Green, a city garden contest, awards to people and plants, and special projects like 10,000 Trees.

What has occasioned these developments? It's tempting to claim credit for our own initiative. But, in fact, they are due, in no small part, to changes in the culture in which we operate. With the passing of the professional gardener, we have come to rely increasingly on our membership for horticultural exhibits, and these have proved to be of wider interest to the public precisely because they are produced without the resources of a great estate. Similarly, our landscape nursery exhibits and plant society displays are popular because they appeal directly to today's "do-it-yourselfer." The same is true of this magazine.

The origins of our public service programs are less obvious. One of them, unquestionably, is the fact of our headquarters location. Acceptance of a rent-free building constructed at public expense carries with it the obligation to do something for the public in return. The necessity for people to confront and tackle the problems of living in the city is another important factor. Still another is the widespread interest in green things, which has made people eager to grow plants under less than ideal circumstances.

The history of PHS is a story of action and reaction. Sometimes we can see a little way ahead and prepare for the next turn in the road. Sometimes we are slow to sense what is happening, and we have to scramble to catch up. The important thing is to remember, in the words of John Masefield

"For all things change, the darkness changes
The wandering spirits change their ranges
The corn is gathered to their granges.

The corn is sown again, it grows;
The stars burn out, the darkness goes.
The rhythms change, they do not close."

Ernesta D Ballard

Ernesta D. Ballard
President



photos by Barbara Bruno

The golden stems and crowded, sunburst seedheads of *Allium tuberosum* contrast powerfully in the autumn garden with white, blue-green and green plants.

an autumn garden

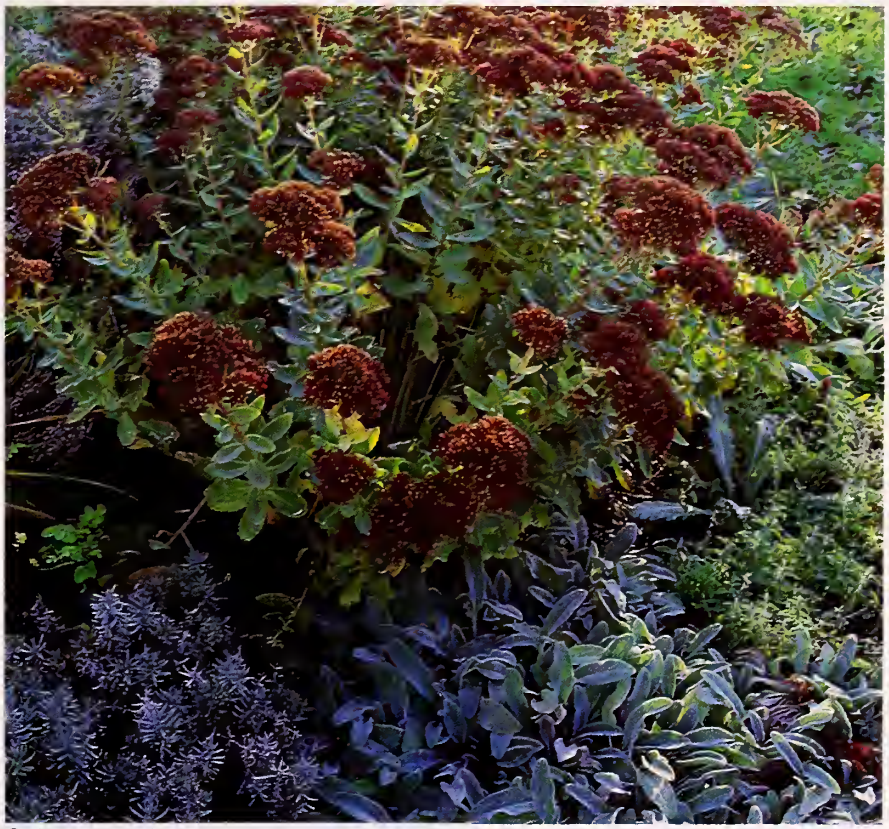
by Barbara Bruno



A dark tracery of empty branches canopies a clump of warm-toned *Lysimachia ciliata*

Spring is the heady, high point of the horticultural year for most gardeners, but, for me, time has tempered that intoxication. Now I view with equal pleasure the approach of year's end. This change of heart was gradual. Over the years an expanding appreciation of autumn's restorative touch has added much to my delight in that season's more renowned accomplishments. The awakening of fragments of the summer garden from heat-choked torpor arouses in me as keen a pleasure as that offered by the vernal quickening of frost-numbed greenery. I, too, am refreshed at that time of year when trees cast off their leaves with gaudy indifference; when spent perennials plump into fresh and bedewed new growth while other garden occupants' colors rival their arboreal cousins; when, here and there, from the fleshiness of summer emerge spare shapes, skeletal works of art, elegantly complete, and, finally, when glowing late bloomers spread rich amethyst, sapphire and carnelian above leafy settings of silver, apricot and gold. Add the dazzle of shining berries, rise early to

continued



Sedum spectabile accompanied by autumn grays

view these works through an autumn morning's golden mist, and you may find you also share my views.

The perfect garden of glowing fall color doesn't materialize from summer's dust unaided. Careful placement of the ingredients in this banquet is necessary to create a color feast for the eye rather than a serving of leftover plant goulash. The planning should begin with the new year's first suggestion of the feasts to come—the arrival of the new batch of seed catalogs. But how many lists and designs are compiled with even a passing thought to the autumn garden? Many gardeners' end of the year plans consist of plunking a few chrysanthemums into the faded border. These tardy beauties do add a dash of life to tired beds, but their Persian carpet colors would be much enhanced if plans had been made to include among them perennials, which are at their best as cool temperatures and clear skies sweep away faded summer's cobwebs.

Autumn offers more useful material than is at first apparent. Your garden may already contain plants which could be put to better use. A rearrangement to make the most of fall's bounty could be all that is needed. Shape, leaf texture and color are as important now as at any other season. That means that not all useful plants need produce flowers at year's end, although some might be late bloomers with a long season of usefulness—their healthy foliage providing a background for earlier bloom. Some previously flowering plants may be made use of, their autumn value being attractive foliage, handsome seed pods or brilliant leaf hue.

As fall has grown in my esteem, I have sought out plants to liven these months of harvest and hunter's moon. Now the shortening days find my garden at its most colorful. Perennials with leaves in tones of apricot, pale gold, parrot green and dusty purple form lively clumps beneath the burgundy and scarlet of dogwood trees. The profuse fruits of gaudy crab apples, in golden yellows and candy red, make these small trees even more prized than during their burst of spring bloom, while the new growth of silver leaved plants in every shade of shadowy pewter, fresh silver and powdered gray-green contrasts strikingly with the brilliant autumn colors and the mellow browns of gaunt seed pods.

perennials

Two herbaceous perennials stand out in this garden for their autumn leaf color. Both are American natives—healthy, carefree plants, which are a joy at any season. Bluestars *(Amsonia tabernaemontana)* is one of these. Slim, neat, understated good looks and a willingness to grow, in sun or shade, in any kind of soil make it a most useful plant, but it is in the fall garden that it shines. Its slender, elegant leaves on gracefully leaning (but never flopping) stems and plentiful, slim-fingered seed pods, all a monochromatic champagne yellow, provide a dramatic background for brilliant, late blooming chrysanthemums in any of their jewellike tones. Or, keeping its autumn charms in mind, plant it against a somber, evergreen setting. If you can arrange it so that morning sunshine backlights the plant transforming it into the legendary golden bough, so much the better—a happy accident here that could easily be repeated.

Fringed loosestrife *(Lysimachia ciliata)* is valuable throughout the growing season. The burgundy leaf rosettes of spring retain their rich color as they grow taller, until at midsummer the foliage mellows to an unusual bronzy olive, an attractive foil for the sprinkling of starlike, yellow flowers. While not showy, these blooms compliment the brassy daisies and daylilies so prevalent at summer's zenith. With the return of frosty nights the foliage blushes a kaleidoscope of apricot, peach and beige tones unlike the autumn coloration of any other plant I know. Its only fault is a lusty, wandering urge, which makes frequent curbing of its creeping rootstock necessary.

Careful placement of the ingredients in this banquet is necessary to create a color feast for the eye rather than a serving of leftover plant goulash.

Another valuable plant in the fall garden with fine, colored leaves is purple sage *(Salvia officinalis* 'Purpurea'*)*. While this plant has purple toned leaves all year the return of cool temperatures encourages new growth in a particularly lovely shade of clouded violet. Plant it with golden oregano *(Origanum vulgare* 'Aureum') which sports foliage in parakeet green, then add burnt orange chrysanthemums for an eyecatching sight.

a life after death

By now most flowers have faded, but a handful can be counted on to remain effective through late autumn. A few die so gracefully that their usefulness continues long past their demise. Leaving behind colors that gently dim, their lifeless forms imperceptibly stiffen into winter husks. One of these, *Sedum spectabile,* possesses an extra long season of attractiveness. It is a plant of substance and weight, useful where contrast with more filmy material is needed. The thicket of fat stems and succulent leaves forms a symmetrical clump, which is always neat and attractive, gaining in size and importance as summer progresses. The variety that I grow with flowers of an intense carmine red is so handsome at all stages that I can't decide whether I value it most for its bloom or seedheads. The transition between the two is so gradual, it's difficult to say where one starts and the other ceases. The rich rust seedheads are fine additions to dried, winter bouquets, but since they are so effective in the garden they will be left to survive the elements a while longer.

I allow a few gray leaved clumps of creamy-white flowered curry plant *(Ghaphalium obtusifolium)* to self-sow in a border reserved for late summer bloom. The fluffy flowers of this wildling are a great blender. After poofing away its dust-fine seed on a cloud of silken fuzz it ages to a dim, brittle, off-white mass, which still appears bright against autumn's somber tones.

Lavender clouds of tiny blossoms make statice *(Limonium latifolium)* most useful in midsummer for toning down overly exuberant colors. Now it is a wispy, gray mist, still quite pleasing among more colorful neighbors. On dewy mornings its village of tiny spider webs magically appear, only to vanish when touched by the first shafts of drying sunlight.

After the last leaf has fallen, mummified fingers—stalks, calyx, chaff—still



photo by Barbara Bruno

Striped grass, *Miscanthus sinensis* 'Variegatus,' still a graceful garden occupant in late fall

remain. Branches, supple or stiff, graceful or sturdy, hold precious specks of life awaiting winter's rough release. Clothed in a palette of subtle tones, these last garden ornaments, nature's sculptures, can be admired until wind and snow wipe clean the slate in preparation for the vernal awakening.

While many plants do need cutting back to promote new growth and maintain neatness, the autumn garden profits from the preservation of those skeletal growths and seed pods possessing rich color or architectural interest. One such plant is *Allium tuberosum,* the flowering garlic. Valued in the late summer for its abundant globes of white bloom, it is still notable in the autumn garden when other flowering onions are only memories. The forest of golden stems and crowded, sunburst seed heads are most attractive in or out of the garden.

Another plant of autumn interest, burgundy leaved perilla *(Perilla frutescens* 'Atropurpurea'), is also a fine garden ornament all summer. Now, with the leaves gone and the warm, brown stems strung with a delicate tracery of tiny calyx bells, it is autumn personified. A clump, silhouetted by deep shadow, stands in a spot where the setting sun transforms it into a dramatic, late day spectacle, backlighting the intricate, silken-haired stalks with an aura of liquid gold.

Ornamental grasses with tall, waving plumes or low fluffs and tufts of delicate stemmed, wheaten growth are admirable features of the fall garden. *Miscanthus sinensis* 'Variegatus' is an old-fashioned notable with vertically striped leaves in creamy yellow and green. Earlier in the season it makes an especially fine backdrop in a border crowded with the butterfly brilliance of flowers in yellows and oranges. At summer's close tall, robust clumps sprout plentiful, silken tassels the color of an ashen, Hollywood blond. These graceful panicles stir languidly with every slight autumn sigh, remaining bright and interesting late into winter.

This season as we immerse ourselves in the catalogs with their technicolor pictures and magical descriptions seductive enough to weaken the will of even the most resolute among us, we would do well to consider the autumn garden. Many plants, which make fine additions to the fall garden, are readily available. When composing your seed and plant lists be sure to include a few plants to light your borders at the close of the year.

●

Barbara Bruno is a frequent contributor to *Green Scene.*

A Case for the Wardian Case

by Robert Preucel



photos by Edmund B. Gilchrist, Jr.

Robert Preucel's Wardian case at the Flower Show. See sketch on p. 9 to identify orchids.

Two years ago I began thinking about a way to display small orchids at the Philadelphia Flower Show. Small orchids are usually lost from view in an exhibit when shown with other larger species and hybrids. If displayed in pots they are out of focus and suffer from dust and lack of humidity. Some form of terrarium seemed to me to be a way to protect the orchids from dust and to keep a higher humidity around them. I then looked up the origin of terrariums and came upon the term, "Wardian Case." I called my good friend, Dr. Jack Fogg, and asked him about the Wardian Case and he immediately described with his usual skill how it was developed and presented a brief, but fascinating profile of the man who invented it. It whetted my curiosity and I searched and found more information, which I share with you.

In the early part of the eighteenth century in London there lived a physician named Nathaniel Bagshaw Ward, a man who was much interested in horticulture and had many plants growing in his laboratory. He had placed some earth containing the chrysalis of a sphinx moth in a bottle with a lid on it so that he could see the development of the moth. Soon he noticed that some small ferns and grass had sprouted in the bottle where they were growing

with vigor although they were not being watered. Since the bottle was corked, air could not enter nor could moisture escape. He had created a small self-contained microclimate; the moisture would rise in the daytime and condense at night on the inner wall of the bottle. The moisture cooled on the wall then ran back into the soil. After observing the process for some time Ward decided to adapt the idea for transporting plant material under difficult conditions.

Ward knew Sir W. J. Hooker at Kew and Dr. Lindley of the Royal Horticultural Society, and he knew of their difficulties in transporting living plants. He had talked with Archibald Menzies, who had told him the sad story of his voyage around the world with George Vancouver, the explorer, and how he had lost all the living plants he had collected. At that time, large boxes filled with various collections were placed on board sailing vessels, covered with canvas and lashed to the poop deck. After exposure to wind, salt water and extremes of temperature few plants could survive.

They traveled by ship through a temperature range of from 120° when crossing the equator down to 20° at Cape Horn where the decks were covered with frost and snow. When they arrived back in England after eight months of such extremes of weather, the plants that had been placed in the cases were found to be growing and healthy.

Dr. Ward believed that if he could construct a closed glass case it would allow live fragile plants to be transported successfully. With help, he produced two small cases made of glass and mahogany. He filled the cases with plants, and they were shipped to Australia where they arrived in perfect condition. The return journey of the Wardian cases was the real test. They traveled by ship through a temperature range of from 120° when crossing the equator down to 20° at Cape Horn where the decks were covered with frost and snow. When they arrived back in England after eight months of such extremes of weather, the plants that had been placed in the cases were found to be growing and healthy.

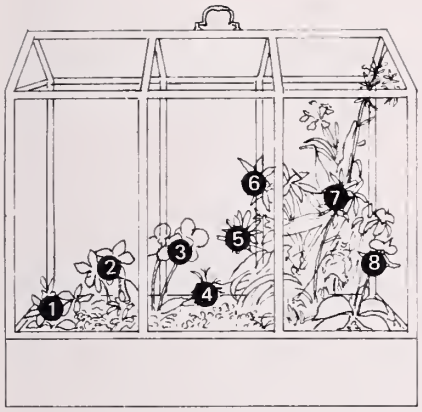
At that time, owners of large country estates in England were looking for exotic and unusual plants to grace the huge glass conservatories that were being erected. The Duke of Devonshire was anxious to send a gardener to India to secure *Amherstia nobiles,* rare orchids and other tropical plants for his great house, Chatsworth in Derbyshire. Others had similar ambitions. The idea of using the case caught on rapidly and many adaptations were made but the name Wardian persisted. Various models were used in the Victorian drawing rooms of the period and were filled with ferns and other attractive material. They were soon made of metal which increased their longevity.

I was able to secure a picture of Ward's original case from a friend in London, and I considered how it might be reproduced. Fortunately, I found a most skilled artisan, John Bunker of Exton, Pennsylvania, who works with his son John, reproducing and restoring antique furniture. I took the picture to Bunker, and he set to work enthusiastically on the project and produced a very handsome reproduction of the Wardian Case. I have used it as a container in which to display orchids at the last two Philadelphia Flower Shows. The plants survive perfectly and the public actually can see how the first orchids arrived in England.

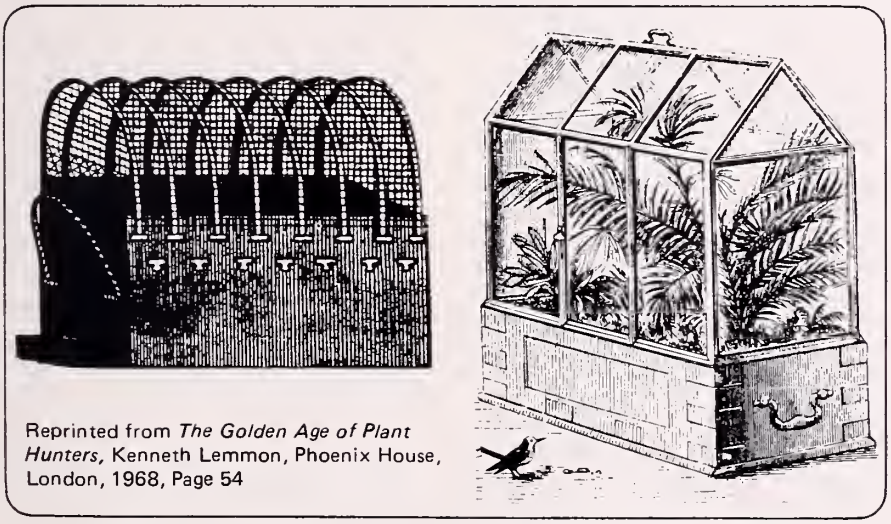
I have not used the case to grow plant material in my house, but rather to give various foliage and blooming specimens a protected environment for temporary display in our library.

●

Back in his medical school days, Robert Preucel became interested in orchids. He credits Wilbur Zimmerman with stimulating the interest. Preucel now has a small greenhouse for his species and hybrid collection of orchids. He is the 1980 chairman of the Philadelphia Flower Show.



1 *Phalaenopsis* 'Gertrude Homsher' x *Phal. spica*
2 *Phalaenopsis* 'Yellow Ice'
3 *Phalaenopsis* 'Yukon Ice'
4 *Dendrobium linguiforme*
5 *Ornithocephalus bicornis*
6 *Laelie harpophylla* x *Cattleya* 'Catherine Walker' x *L. harpophylla*
7 *Miltonia flavescens*
8 *Paphiopedilum procrustes* 'Long Beach' x *Paph. callosum*

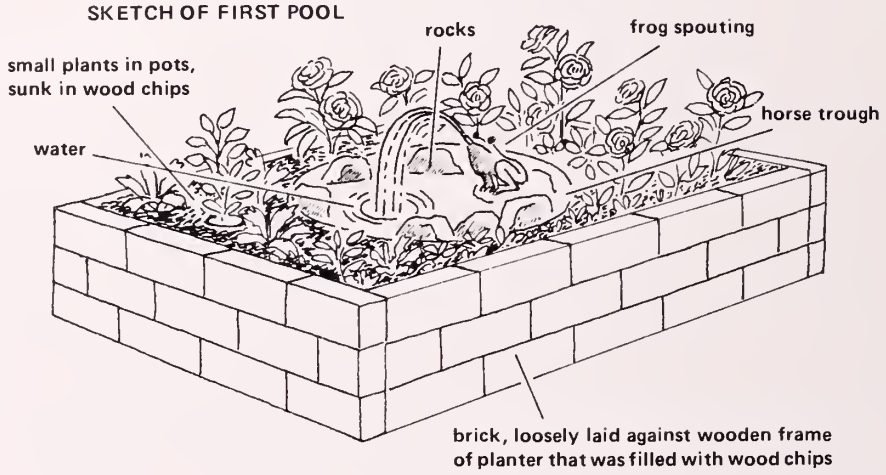


Reprinted from *The Golden Age of Plant Hunters,* Kenneth Lemmon, Phoenix House, London, 1968, Page 54

INDOOR GARDEN POOLS

by Helen Tower Brunet

SKETCH OF FIRST POOL



Fifteen years ago we built our first indoor garden pool. We had just bought a Victorian house, which sometime in its history, had a jalousie-windowed porch added. It was a big room, facing east, but shaded by overgrown hemlocks. Although it had electric heaters, we knew it would be too cold in winter for our tropical house plants so we planned to relegate it to storing summer furniture and tricycles.

We arrived there in December with children and pets, and before we could stash the bikes and summer furniture, friends had presented us with two dozen camellias in enormous tubs. The room became an instant winter garden. A small pool would complete the scene, we thought, and provide extra humidity. But it had to be a small pool that could be produced on a very tight budget.

Poking around junk shops we found the ideal thing—an old iron horse watering trough, which we scraped down and painted green. It measured 36 in. x 18 in. and was about 18 in. deep, a good size for concealing the pump with large rocks. We built a rectangular planter around the trough on three sides, made of wood and lined with aluminum flashing. It was filled with wood chips. Small plants could then be sunk in it, their pots covered for a natural look. Our biggest investment was a frog fountain. A Little Giant Pump (available at most garden centers) was the next item, then a length of surgical hose that exactly fit the connection on the frog. The least expensive but most difficult part to find was a small copper coupling to connect the hose to the frog. We spent three Saturdays searching in hardware stores and finally found it in a plumbing supply outlet. At last the whole arrangement was hooked up, the pump disguised with some hand-picked rocks from a nearby stream. We filled the pond with buckets from the kitchen and plugged in the pump.

Then one day, disaster struck. Suddenly the pool and the surrounding planter were enveloped in cascading soap suds. It was obvious that some little hand had put a pinch or two of Tide in the pool to see what would happen.

The effect was sensational. Camellias everywhere, the subdued light, and the sound of running water. The electric heaters allowed us to warm the room enough for comfort, and then turn the thermostat back down to 50°F, which was good for the camellias. We loved to sit out there; the children were fascinated with the frog spouting water. Then one day, disaster struck. Suddenly the pool and the surrounding planter were enveloped in cascading soap suds. It was obvious that some little hand had put just a pinch or two of Tide in the pool to see what would happen. Nobody confessed.

We were faced with the problem of emptying the pool, which we had not anticipated. We carried buckets out and dumped them in the snow. Finally we got smarter and with a garden hose siphoned the water out of the window and drained the pond.

We filled and drained the pool countless times. We scrubbed it, flushed the hose, boiled the frog—in short, sterilized the whole apparatus, but the soap suds persisted.

Eventually they disappeared, after almost a year. In the meantime we had grown accustomed to the frog blowing bubbles

the queen anne tub

Seven years later we sold that house and moved to the country. This time we built a house and had to count every square foot. We built a garden room for the camellias but somehow we couldn't make the room large enough for both the plants and an indoor pool, so the pump and the frog were stored in the basement, but not for long. We were asked to decorate a bathroom for a designer house to benefit the local hospital. The Queen Anne tub was a natural place for a pool, so we proceeded to transform the bathroom into a small garden. We painted the tile walls with stucco-like paint, suspended plants from the ceiling, walled in the bathtub



photo by Molly Adams

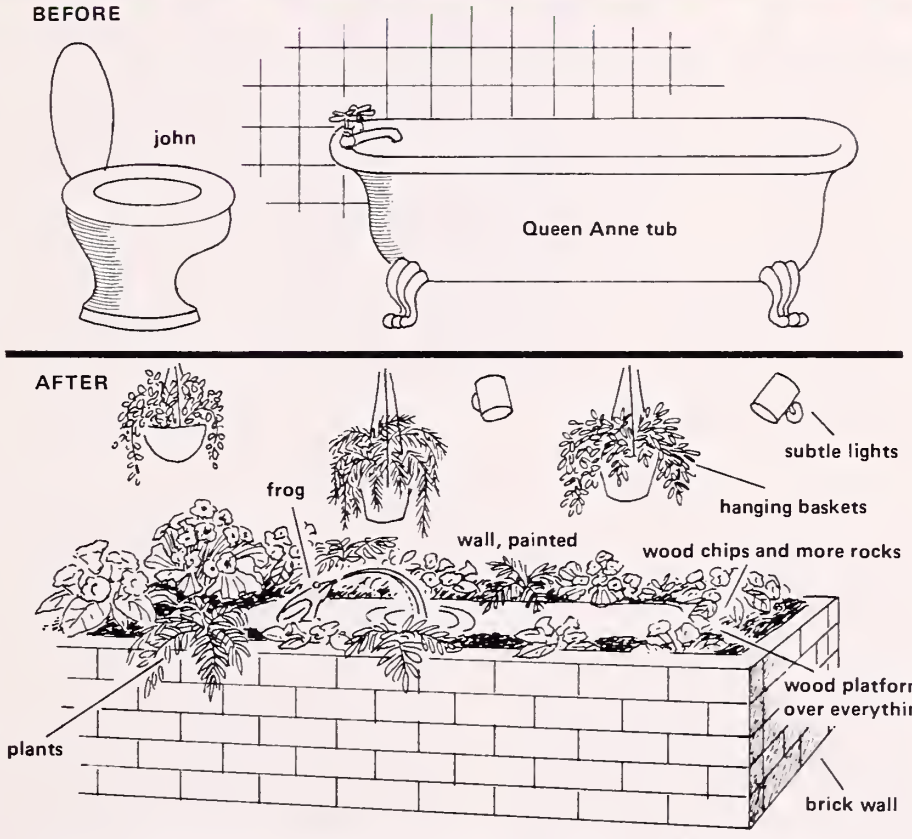
Irwin Adams pool

with loose bricks, and put white gravel on the floor to make a garden path. Then came the fun. We lined the tub with black plastic and built a wooden frame to place over the whole tub, with an irregular opening cut in it to resemble the natural outline of a woodland pool. The wooden frame was then covered with wood chips deep enough to sink small pots of ferns, primroses and sinningia. The pump and frog were anchored in the tub with some rocks, and we were back in our grotto again.

That show house was so successful that two years later the hospital committee decided to do another one. This time we were given a corner of a garage to make into a woodland garden. We began with a child's plastic wading pool, the brightly colored plastic covered with dark green plastic sheeting. This pool was the largest we had done—the width of the pool (about 6 ft.) made it possible to use water plants with interesting rocks arranged along the edges. Again it was surrounded with wood chips interplanted this time with wildflowers.

The frog has been in the basement

continued



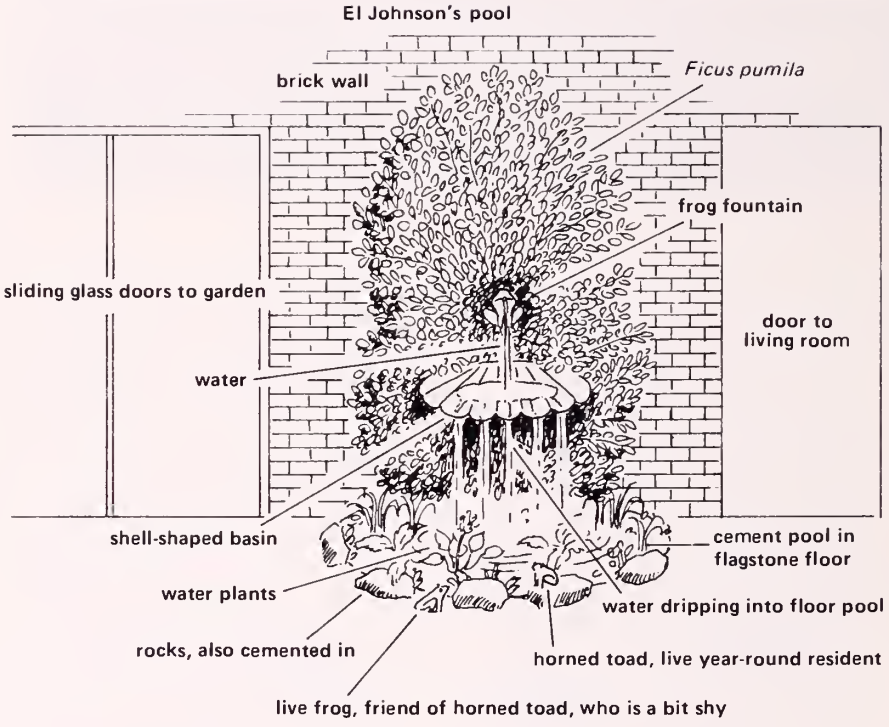
Former Queen Anne tub transformed, lined with black plastic. Large rocks, frog and water.

The toilet was also covered with wooden platform, which was then landscaped.



photo by Molly Adams

El Johnson's pool



store room for too long now. We have since built a homemade greenhouse for some of the camellias, and maybe there's room for a small pool in the sun porch. The horse trough is long gone, sold with the old house. The tricycle crowd is now in college. We've been looking around at garden pools and have found two ideas that really appeal.

We could use a free-standing metal pool, the kind available at Erkin's, 14 E. 41 St., New York, which is pictured here. Photographer-writer Molly Adams has used this model in the bay window of her dining room garden. Molly's dining room has three ingredients that made using the pool much easier: an electrical outlet nearby, a faucet, and most important, a drain in the floor for ease in cleaning the pool. There are many different models of free-standing garden pools such as this. Molly's advice in shopping for one is to avoid those that have compartments for plants at the side and the front of the pool. These fill up with water from the splashing fountain and have to be cleaned out.

A neighbor, El Johnson, has a cement pool set right in the slate floor of her glass-enclosed garden room. Johnson feels this kind of pool—which was made by a mason—is only practical to install in either a new room or one in which the floor has to be changed. In the Johnsons' case, the floor was being removed to install radiant heating. The water is pumped up from the pool through a copper tube set in the wall, and comes out the mouth of a frog (just like ours, I noticed—so at least we have a start . . .), drops down into the shell-shaped basin (also from Erkin's but available elsewhere) and then drips down into the pool itself. A frog and a small horned toad live in the pool, in among the cyperus. Johnson says cleaning is necessary every six weeks or so because of fallen leaves and soil from the plants. She drains the pool (through a drain in the bottom of the pool connected to a pipe to the outside) for a day and runs liquid Ajax through the pump, tubing, and right out the frog to clean it. In summer all of the container plants are placed outside, but the *Ficus pumila* growing up the brick wall still needs tending, and the pool is kept filled for the frog and the toad.

Both kinds of pool do a great deal to enhance the attractiveness of the plants around them, as well as increasing the humidity. The Johnsons have an oscillating fan mounted near the ceiling to provide more evaporation.

We have been greatly inspired by both of these pool gardens. We still can't decide which type to build. But one thing is sure—the pump and the frog have been brought out of storage and are standing by, ready whenever we are.

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Helen Tower Brunet is a garden writer whose column, "Gardening Indoors," appears in *Yankee* magazine. She is a frequent contributor to *The New York Times* and has written a book on house plants, *Green Grow Your House Plants.* She gardens in a cold porch, under lights, in a homemade greenhouse and outdoors all summer.



DECK THE HALLS...

by Charles Rogers

The Christmas carols urge us to "Deck the Halls with boughs of holly," sing "O Christmas Tree," and tell us of "the Holly and the Ivy." All of which recommends an evergreen Christmas. What better advice in a world of plastic flowers, plastic people and plastic everything, than to use natural plant material to Deck the Hall . . . this Christmas.

Since most people have a feeling for decorating, and Lord knows each of us has a sense of color and taste, I plan to give here the basics of how to make a wreath, small tree, kissing ball, and other decorations from the ground up, leaving the color and type of decoations up to you. There can be no more discouraging or disappointing experience than to have finished a masterpiece, only to have it start falling apart or to have the greens begin to dry up and the needles start falling off in a short time. These two problems can be cured with proper selection, care and handling of plant material and supplies, from start to finished masterpiece.

cutting the plant material

A great many varieties of foliage can be cut from your own garden or from the gardens of friends or relatives. Normal pruning practices are the rule and the cutting can be done anytime after Thanksgiving. There are several reasons for early cutting: first is time and second, and perhaps most important, is the possibility of an early severe cold snap, accompanied by high winds, resulting in the windburning and discoloration of many types of evergreens.

The plant material should be cut and stored according to future use. Yews, firs, spruces, pines and other large branches should be placed in large plastic bags, sprinkled with water, tied shut and placed in a cold, dark place. Arborvitae, boxwood, cypress and smaller greens can be kept in separate plastic bags. Some types of greens including hollies, laurel, *Magnolia grandiflora,* osmanthus, and *Cedrus atlantica,* should have stems crushed, placed in water and the foliage covered with a plastic bag. The greens stored in this manner will keep fresh and will have a more lustrous appearance after two or more weeks in the plastic, than freshly cut greens.

continued

LIST OF PREFERRED CHRISTMAS GREENS

Indoor–Outdoor Use

Key

R — roping
D — decoration and contrast
T — tree
K — kissing ball
W — wreath
A — arrangement
S — swag
TO — topiary – espalier

Common Name	Scientific Name	Uses
Nordmann fir	*Abies nordmanniana*	W A S
Atlas cedar	*Cedrus atlantica*	A in water
Himalayan cedar	*Cedrus deodara*	A in water
Hinoki cypress	*Chamaecyparis obtusa*	All
Cypress	*Chamaecyparis* spp.	All
Juniper	*Juniperus* spp.	D W A
Southern magnolia	*Magnolia grandiflora*	D A S
Pine	*Pinus* spp.	R A S
Douglas fir	*Pseudotsuga menziesii*	R W A S
Arborvitae	*Thuja* spp.	R W A S
Boxwood	*Buxus* spp.	All
Holly	*Ilex* spp.	D W A S
Laurel	*Kalmia latifolia*	R D A
Holly — Olive	*Osmanthus aquifolium*	D A
Cherry — Laurel	*Prunus lauracerosus*	D A
Yew	*Taxus* spp.	All
Cryptomeria	*Cryptomeria* spp.	D A
Mahonia	*Mahonia* spp.	D A

Cut Greens for Outdoor Use

Key

W — wreaths
S — swags
R — roping
C — cemetery

Common Name	Scientific Name	Use
Spruce	*Picea* spp.	All
Hemlock	*Tsuga canadensis*	C
Fir	*Abies* spp.	All

Berries for Decorating

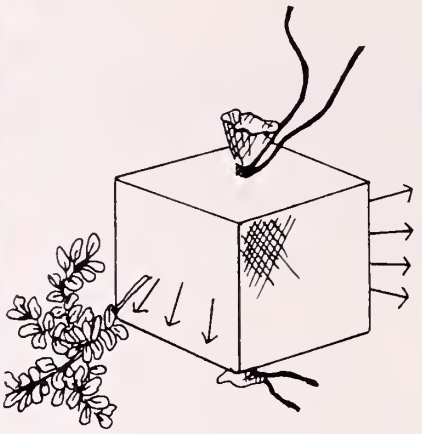
Common Name	Scientific Name
Cotoneaster	*Cotoneaster salicifolius*
Winterberry	*Ilex verticillata*
Nandina	*Nandina domestica*
Wild rose hips	*Rosa multiflora*
Bayberry	*Myrica pennsylvanica*
Firethorn (red)	*Pyracantha* spp.
Holly	*Ilex* spp.

Note: There are most certainly some varieties of plant material missing from this list that are among your favorites. I have chosen these, however, because they all grow in the Delaware Valley and should be available without too much trouble.

Evergreen Kissing Ball



photos by Chuck Rogers



art from a concept sketched by Janice Rogers

Boxwood — *Taxus brevifolia*

Topiary Tree



Boxwood - *Buxus sempervirens 'Suffruticosa'*

foundation and form supplies

Most people who do flower arranging have many of the materials and tools already on hand. It will be much easier to do the job if you have the right tools. The following list is perhaps a bit on the ideal side but nonetheless all very useful.

- Oasis blocks
- Styrofoam — 2 in. x 12 in. x 36 in. sheets (green)
- Long fiber sphagnum moss
- Chicken wire
- Spool wire — No. 23 gauge
- Oasis tape or some type of waterproof tape
- Wired picks — 3 in. or 4 in.
- Green jute twine
- ¼ in.-½ in. nylon mesh netting
- Flower arranging apparatus — pin holders, etc.
- Wire wreath frames
- Sharp pruning shears
- Pliers
- Scissors
- Bowls and containers

the three p's

Now we must consider the most important part of Chrismas decoration making. The three P's—patience, perseverance and profanity; if we should lose the first two the third will become a reality.



Evergreen Kissing Ball

Materials

½ block of oasis 4½ in. x 4¼ in x 3 in. (soaked)
1 pc. nylon mesh netting ¼ in. or ½ in. holes 24 in. x 24 in.
spool wire — No. 23 gauge
boxwood, *Taxus brevifolia*

The lovely geometric kissing balls have many uses in colonial, victorian and contemporary homes. They are elegant hanging in a stairwell, in front of french doors and picture windows. When properly constructed of selected plant material they can be used for many weeks. The most satisfactory plant material is boxwood (English, American or Korean), yew *(Taxus cuspidata* 'Nana') and hinoki cypress. When the plant material is cut for making the kissing ball it should be 4 in. - 7 in. long depending on the size of the kissing ball desired. The cut should be made on a 45° angle and the bottom 2 in. - 2½ in. of foliage removed. This creates a pointed end to push into the oasis and will remain wedged.

The foundation for the ball is ½ of a block of oasis presoaked, then placed in the center of a 24 in. x 24 in. square of nylon mesh netting. This mesh should have holes no smaller than ¼ in. or larger than ½ in. and can be protective garden netting, a veil from an old hat or an onion or orange bag. Whichever one you use it should be made black even if you have to use black spray paint on it (note: spray netting and let dry before using it to wrap the oasis). The ends are then gathered about the top of the block and secured with a long piece of No. 23 gauge spool wire. Make sure the wire is firmly attached and long enough to use as a hanger.

The foundation is ready. Now all that needs to be done is to push the cut greens (4 in. - 7 in. long) into the oasis base. The quantity needed will vary with the denseness desired. If you choose to decorate and use the ball immediately, let your imagination run wild; add ribbons, bows, dried material, cones and fresh mistletoe to your heart's content. However, if you do not wish to do everything on one day, sprinkle the freshly made (undecorated) kissing ball with water, place it in a tight plastic bag and hang it in a cold place (don't let it freeze). The ball can be stored for up to two weeks or more.

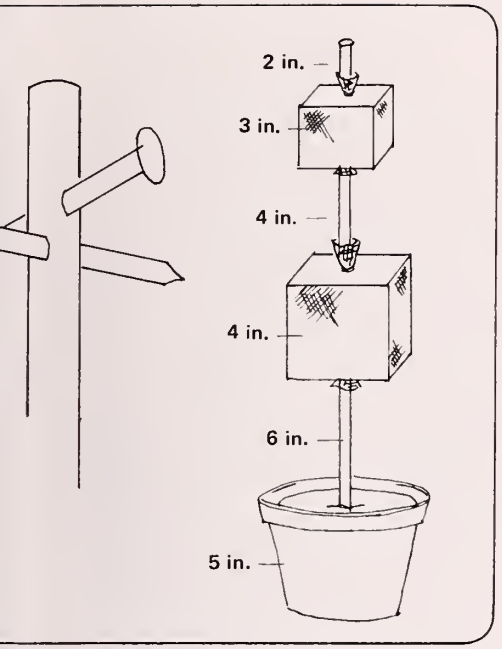
For a dramatic effect consider a double kissing ball, one hanging from the other, one smaller than the other. Make sure that the hooks and hangers are in place on each ball and marked with a small piece of ribbon. This makes it much easier to assemble once the plant material is in place.

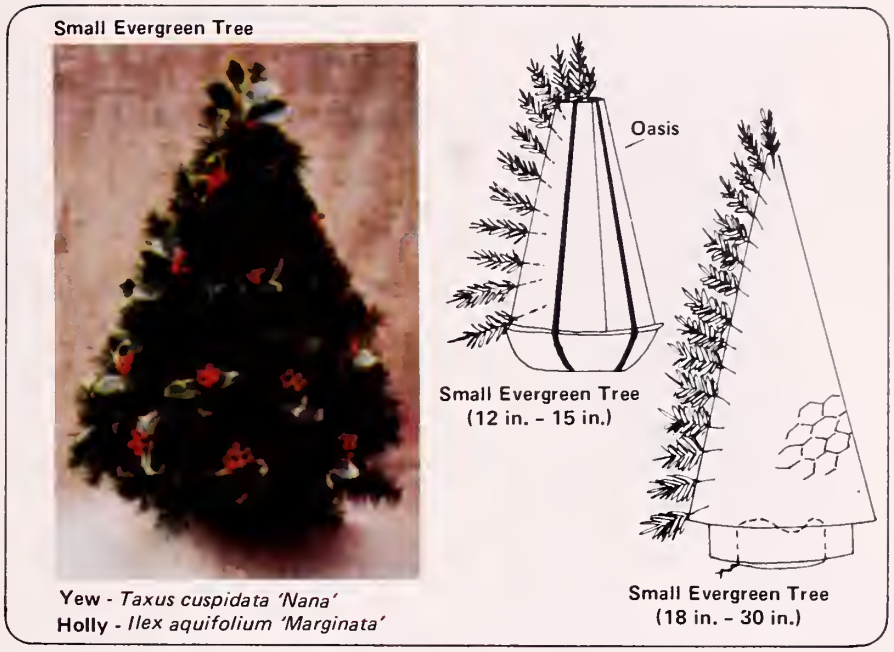


Topiary Tree

Materials

1 pc. oasis 3 in. x 3 in. x 3 in. (soaked)
½ block oasis 4½ in. x 4¼ in. x 3 in. (soaked)
1 pc. nylon netting 24 in. x 24 in.
1 pc. nylon netting 20 in. x 20 in.
4 - 10 penny finishing nails
1 - 3/8 in. wooden dowel 24 in. long
1 - 6 in. flower pot
plaster of paris
No. 23 gauge spool wire
boxwood greens





Yew - *Taxus cuspidata 'Nana'*
Holly - *Ilex aquifolium 'Marginata'*

A topiary tree is an interesting variation on the basic form of the kissing ball, except in this application there must be a foundation to hold it perpendicularly. Step by step, start with a 6-in. clay pot, fill with wet plaster of paris and insert the 3/8 in. dowel to the bottom of the pot, letting the plaster harden overnight. The dowel should be predrilled as in the diagram with two holes large enough to push the nails through: one at a 90° angle and an 1/8 in. higher than the other at the 11 in. mark. The second set of holes in a like manner at the 19 in. mark and the top end should be pointed. With the bottom set of nails inserted, place the center of the 24 in. square piece of netting over the dowel letting it come to rest over the nails. Next place the center of the larger block of oasis over the dowel and force it down to the nails, gather the netting over the top of the block and secure it tightly around the dowel with spool wire. Insert the top set of nails and repeat the process with netting, oasis and securing the netting ends at the top of the dowel.

Boxwood works best in making topiary trees perhaps because of its woody stems. When pushing the boxwood into the oasis it is helpful to hold or brace the opposite side of the block. Remember when using oasis you can't make too many changes of greens in the same spot, so it is advisable to cut (at 45° angle) all the greens you might need to the same length (4 in. - 7 in.), thereby insuring uniformity. The finished topiary can be decorated for immediate use or stored in a plastic bag.



Small Evergreen Tree — 10 in. - 15 in.

Materials
1 block of oasis tapered
oasis tape
5 in. bowl (1 lb. margarine container)
boxwood, yew or hinoki cypress

This small tree is rather simple to make with the basic form consisting of a whole block of oasis tapered on two opposite sides, placed in a bowl and secured with oasis tape. The only trick is in the shape of the tapered block. The two tapers should be cut on the 3 in. sides of the block leaving at least 1¼ in. flat surface on the top. This flat surface is to allow enough space for the tape and room for the top pieces of evergreen. With the tapered oasis securely in place, cut the evergreens to the desired length allowing some longer ones for the top of the tree. Again make sure that you strip 1½ in. - 2 in. of foliage from the bottom of the evergreens and be sure that the cut is made at a 45° angle. It is best to establish the height, width and shape first. This can easily be done by placing the top pieces of evergreen first, then four pieces equally spaced around the middle and six pieces equally spaced around the bottom. With the dimension quidelines in place all one has to do is fill in between.



Small Evergreen Tree — 18 in. - 30 in.

Materials
Chicken wire - 1 in. mesh
Long-fibered sphagnum moss (soaked)
Block of green styrofoam 2 in. x 6 in. x 6 in.
Spool wire

The only difference between a 12 in. tree and one 30 in. is the form required to make it. Trees over 15 in. cannot be supported by oasis and therefore require a form made of chicken wire. A cone should be formed with one inch mesh chicken wire securing the side. The cone is then stuffed with soaked, long-fibered sphagnum moss. When the cone is tightly filled, close the bottom with another piece of chicken wire securing it all the way around the opening making sure it will sit flat providing a vertical cone. The block of styrofoam can then be wired to the cone and used as a base or stand. If you wish, the cone can be placed on a low flat tray or similar container instead of using the styrofoam. The placing of evergreens then follows the pattern set forth in the directions for a 12 in. - 15 in. tree; more dimension guidelines can be used as needed.

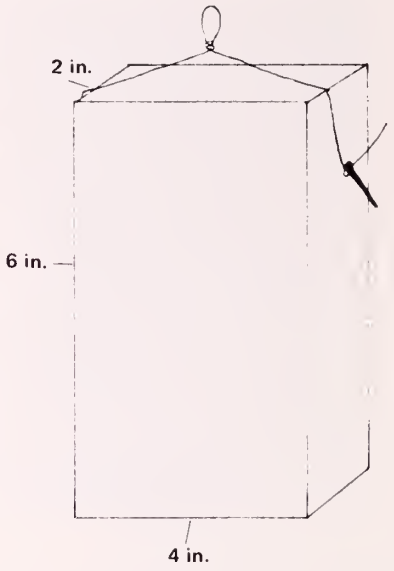
These trees when decorated with berries, variegated holly, small cones, ribbons or even small white carnations can be used for the dining table, coffee table or for shut-ins. An interesting variation is to make half a tree, leaving

continued

Swag



Nordmann fir - *Abies nordmanniana*
Var. Holly - *Ilex aquifolium 'Marginata'*
Chamaecyparis - *Chamaecyparis obtusa 'Tetragona'*
Blue Chamaecyparis - *Chamaecyparis pisifera 'Cyanoviridis'*



the back part undecorated. Alone or in pairs these half trees make great decorations for the mantle.



Wreaths

All of us have made a wreath or more in our time, so I will not devote much space to the process. However there are several hints or comments that seem to be in order.

Making a wreath with varying degrees of success seems to depend greatly on the mechanics we use. How many have tried to make a wreath on a rounded coat hanger only to have half of the evergreens slip around to the back side of the hoop. Success will be guaranteed only if you use the proper frame in the first place. Four of the best types of frames are:

1. Flat wire wreath frame (purchased)
2. Box wire wreath frame (purchased)
3. A hoop made of interwoven 10 - 15 gauge wire
4. A hoop made of interwoven privet or forsythia cane

The hoop of interwoven wire should be at least two wires thick so that the finished wreath won't sag. The privet or forsythia canes should be about 6 ft. long, softened (by soaking or by pressing with your hands) before shaping into a hoop, and then reinforced with another cane interwoven for stability. In all four types of frames I have found that pieces of long evergreen (12 in.) placed 1 in. - 2 in. thick on the frame and wrapped tightly with spool wire all the way around the hoop makes a perfect base for the finished evergreen bunches. This evergreen base has two important functions. First, it makes the wreath thicker and helps to keep it from drying out. Second, the back side of the wreath looks great when hanging on a glass door or window, with all the wire and base covered with green. Again, wreaths can be made ahead of time, sprinkled with water and stored in a plastic bag.



Swag

Materials
Block of green styrofoam 4 in. x 6 in.
2 - 4 in. picks
Spool wire
Greens

Here's a basic method for making a swag or spray. (I don't like the word spray unless you are going to make an evergreen one for the cemetery.) The swag is made by arranging a bunch of evergreens, wiring them together and hanging them on a door or wall. The method I would like to suggest is for a more formal or stylized swag. The form is a block of styrofoam 2 in. x 4 in. x 6 in., block size depends upon how large you want the swag. About 2 in. down on each side of the block you push a 4 in. pick in at a 45° angle leaving about 1 in. Use spool wire wrapped around each pick, then twisting around the top to make a small loop for hanging. Note: tie a small piece of ribbon on the loop so you can find it when finished. The evergreens are cut on a 45° angle and pushed into the styrofoam, creating whatever shape or form you wish. Decorating is easy; all that needs to be done is to push the stems into the styrofoam at any angle desired.

As a builder constructs a house from a good foundation using quality material and workmanship, completing the project and leaving the decorating to the new owners, so have I presented a number of ways to start Christmas decorating from good foundations and forms, suggesting quality evergreens, supplies and helpful hints towards completing the projects. Now the decorating with berries, cones, ribbons, fancy greens, etc., is left to you and your imagination.

Have a Merry Evergreen Christmas.

Christmas Decorations at the Zoo and Colonial Mansions in Fairmount Park

A sample of Roger's work can be seen at the Philadelphia Zoo from Thanksgiving until December 23. The decorations will transform the Zoo into a wonderland at the entrance, at the Mammal House and at Solitude, a Park house in the Zoo.

Tours of the Fairmount Park Colonial Mansions to See Period Decorations

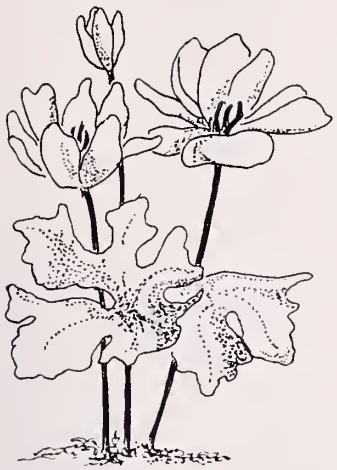
The Park's nine historic houses will be decorated as they appeared in Colonial days. The Christmas decorations will be done by Garden Clubs. Tickets for visits to all nine houses cost $6.00. The houses will be open December 5, 6, 7 from 10 am to 4 pm.

Public transportation: Fairmount Park trolley buses will leave for tours from 15th & JFK Boulevard in front of the Tourist Bureau every 15 minutes starting at 9:45 am. Tickets for the trolley allow visitors to stop off at the houses and pick up the next trolley. On-off privileges are included in the transportation cost: adults, $1.50; senior citizens, $1.00; children, 50 cents.

For more information please call the Park House Office at the Philadelphia Museum of Art — PO3-8100, ext. 304.

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Chuck Rogers is curator of horticulture at the Philadelphia Zoo. For many years he was associated with a Christmas shop in Norristown. In 1978 he prepared the Christmas decorations for the Zoo's House, Solitude, as part of the Fairmount Park Houses Christmas Tours. Each year Rogers grows a large crop of nandina particularly for Christmas at his home and for his church.



If a Rose is a Rose is a Rose ... What's Velvetwort? Wifebalm? Budgetbane?*

An explanation for the bizarre names of some of our wildflowers

by Nancy Rost Goulden

Bloodroot, adder's tongue, skunk cabbage, false miterwort, fleabane. Recipe for a satanic brew? No, just a familiar list of some of our lovely early spring wildflowers. Not only do these names seem out of harmony with that season of warmth, light, and freshly-laundered ideals and hopes, but the relationship of a name such as adder's tongue to the perky miniature yellow lily is certainly not evident at first glance.

This seeming lack of harmony and consistency is related to the obvious fact that these names were not selected by Madison Avenue after a careful and extensive market study, but by observers of nature who wanted something more definite than the "yellow-flower-over-there." Sometimes a special physical feature or function of the flowering plant, such as the colorful drooping blossoms of the Virginia bluebell or the pungent root of wild ginger, was so striking it set the plant apart. Such names seem just as appropriate today as when the first namer passed on his choice to his family and neighbors. More often though a bit of detective work is necessary to connect the traditional name with the plant you encounter in the woods or fields. Often such investigation leads to a new appreciation of some physical characteristics of the plant that were never noticed before and a better understanding of which plants were native Americans and which have their roots in Europe or other parts of the world.

skunk weed and bear weed

Any school child who has tramped through a marshy patch of skunk cabbage *(Symplocarpus foetidus),* flailing the heads with a stick, can make an educated guess as to the origin of its name. The clusters of leaves do look rather like loose cabbage heads, and the odor released from breaking the tissues instantly says, "skunk." The Latin species name, *foetidus,* is even more blunt about the smell. Even though the flowers are as malodorous as the leaves, those of us who are sick of winter, forgive all and eagerly search in the low-lying areas near streams for the reddish purple-brown hoods, close to the ground, which tell us, long before the robin, that spring is on the way. Since this spathe, which encloses the tiny flowers, reminded the Italians of the hoods of the Capuchin monks, they call their relative of the skunk cabbage, Capucini.

Like those people who down chili peppers one after the other and insist their Mexican food cannot be too hot, the still groggy bears every spring would head straight for their favorite spicy food, the skunk cabbage.

The early Swedish settlers in the Philadelphia area apparently were so impressed with another facet of this plant that they ignored both smell and appearance, and named it bear weed. All parts of the skunk cabbage contain crystals of calcium oxalate, an acrid tasting chemical with a real bite. The effect of tasting this plant is so nasty and so memorable that cattle who were ravenous for green plants after the winter of dry fodder, refused to touch skunk cabbage; but not the bears. Like those people who down chili peppers one after the other and insist their Mexican food cannot be too hot, the still groggy bears every spring would head straight for their favorite spicy food.

Since few of us have an opportunity to observe bears in our suburban neighborhoods today, this name has dropped from common usage; but in the Rockies, the black bears can still be seen eating the western relative, the yellow skunk cabbage. The Indians solved the problem of taste (and pain) by drying and cooking the roots of both skunk cabbage species in order to change the chemical makeup of the crystals and produce a starchy flour, free of the piquancy of the raw plant. Repeatedly boiling the leaves will also reduce, if not eliminate, the sting so they can be eaten like spinach, if anyone is hungry or interested enough to take the trouble.

The Indians used similar methods to render the bulblike corms at the bottom of the Jack-in-the-pulpit *(Arisaema triphyllum)* stems edible since this plant also contains the calcium oxalate crystals. After preparation, the little Indian turnip (another common name for the familiar preacher) is said to be bland and insipid; but before heat has changed the chemical arrangement, the blistering effect of the plant juice is responsible for a third common name, memory-root. This comes from the school boy trick of conning a friend into taking a bite of a root he will never forget.

Once most people are introduced to the little Jack (or Jill) standing in the pulpit, they can easily identify and name the plant whether the pulpit is green or purple-brown. The dark-colored spathes provide the source of the genus name, *Arisaema,* which means "bloody" arum (the family name). The myth is told that the Jack-in-the-pulpit grew beneath the Cross of Calvary and was stained by the blood of the dying Christ.

Another flower whose Latin name

continued

*The rose is one of the few flowering plants that has had a consistent name in many different times and places. However, you might want to use the transitional word forms to add to the list of imaginary names I've coined in the title. The way to form these names is explained in the last paragraph of this article.



Slender Speedwell



Virginia Bluebells

photos by Clyde Goulden



Adder's Tongue

is related to the crucifixion is the delicate little slender speedwell *(Veronica filiformis),* whose bluish-purple mat covers our lawns in the spring. The story is told of a Jewish maiden who wiped the brow of the suffering Christ with her handkerchief; for her act of compassion, a true likeness, a *vera iconica,* of his face appeared on the cloth. She became Saint Veronica, and since few people could travel to Rome to see the holy relic, the little face-like speedwell flowers were put in the genus *Veronica* as a reminder of the saint and her kindness. Because of this connection, special healing powers were ascribed to the speedwells. Consequently, some species of speedwell are known as groundhele or Paul's betony. There is no suggestion of who Paul was, but betony refers to a group of plants also known as woundworts whose leaves were used to dress wounds.

The name we're most familiar with, slender speedwell, probably doesn't have a direct medical connection, but since "speedwell," like "godspeed" was a farewell used by friends, it at least suggests "good health and best wishes." Anyone who has picked these tiny flowers and immediately seen the petals drop to the ground, with all due speed, may easily find another explanation for the name.

If you begin to collect the names of wildflowers, you soon notice that a number have the same suffix as woundwort. Although the two words may sound the same, "wort" has absolutely no connection with "wart," but is an Old English word for plant or herb. Coolwort and false miterwort are less well-known names for foam flowers *(Tiarella cordifolia),* those white airy spikes that one may suddenly come upon dancing together in the woods on an early spring day. Foam flower is a good description of the cloud of tiny flowers in full bloom, but the relationship of the Latin *Tiarella* is more obscure. The "little tiara" may refer to the shape of the seed cases or to the shape of the tiny female part of the flower, the pistil. The miterwort is a close relative, and the two may be confused; however since someone decided the foam flower is the mimic, it is called the false miterwort. The location of the "little miter" though is no more certain than the tiara so that character really doesn't help to separate the two. Fortunately there are more obvious differences in the flowers themselves and the leaf stalks.

No special explanations are found



Bloodroot

for the name coolwort, which is also used for foam flower, but it might be deduced that this refers to a plant that blooms when the weather is still cool, or perhaps the term suggests the frosty appearance of the flower clusters. This plant has also been known as Nancy-over-the-ground, but Nancy's identity, if indeed the name ever referred to a specific individual, also seems to have been lost.

too many names

It would appear that foam flower wins the contest for the most common names, but since a plethora of different names in different places and times is the rule for wildflowers rather than the exception, it is probably impossible to name the winner. Unquestionably though, the plant that seems to have the greatest number of inappropriate names is the yellow adder's tongue *(Erythronium americanum)*. When you see the small yellow lily between the pair of splotched leaves, you can make absolutely no connection between the plant and the tongue of a snake; maybe the light and dark patches of the leaves could remind one of a patterned snake skin, but not a tongue. In order to find a logical explanation for the slightly grotesque name, you should visit the woods a few weeks earlier when the plants are just beginning to break through the leaf litter between the roots of the beech trees. The adder's tongue, like many of its relatives, breaks the gound as a tightly furled spear, which gradually unwraps as it grows to disclose the complete plant. It is these small points emerging from the soil which reminded the namers of the darting adder's tongue.

A second common name that is used very often is dogtooth violet. This name would appear to be a total misnomer since the plant is neither a violet nor has any structure resembling a canine tooth. However, dogtooth violet is the common name of a European relative, which has rose-purple flowers and a bulb shaped something like the dog's tooth. And although neither character fits our American adder's tongue, the two plants are similar enough in other traits that the American cousin is frequently called by the older name. Of course, both species are lilies, not violets, but in earlier times, "violet" was often used in a general way, just as we might say "posy" to refer to any small delicate flower.

Most people are more comfortable calling these yellow stars of spring trout lily since trout season and their blooming season are about the same time, and the mottled leaves are an echo of the spotted trout as he slides through the streams flanked by the lilies. A more forthright name (or at least the association is more direct), yellow snowdrop, was given to the plants by the early settlers of Pennsylvania. This name is seldom used today, nor in the Eastern part of the country do we hear the adder's tongue referred to as fawn lily although some of the Western species go by this name. The grand guru of nineteenth century naturalists, John Burroughs, suggested this name because of the similarities between the marks on the leaves and the fawn's spotted coat. The position of the pair of upright leaves reminded him of the alert ears of the listening fawn, and certainly it seemed better to call a lily a lily than a violet.

showiest flower

Another lily, the white wood lily or large-flowered trillium *(Trillium grandiflorum)*, is probably the showiest flower in the spring woods. The slightly artificial cultured appearance of the three perfectly proportioned leaves, sepals, and petals goes nicely with the slightly contrived name formed by the contraction of "tri" (for three, of course) and the genus name *Lillium* (genus of the madonna lily). Several of the trillium species are also known as wake robins since their date of appearance (at least for one of the species) is early enough to summon our favorite symbol of spring and wake him into song.

In addition to the white upright stalked flower of the large-flowered trillium, the careful observer may find the shy bloom of the nodding trillium below the leaves or the maroon petals nestled in the mottled triangle of leaves of the toad trillium or sessile (stalkless) trillium. The Indians, who used the thick rootstalk as an aid in childbirth, called the trilliam birthroot.

The Indians, who used the thick rootstock as an aid in childbirth, called the trillium birthroot.

The Indians may also have used the bloodroot *(Sanguinaria canadensis)* as a drug, but its greatest attraction no doubt was as a source of a natural dye. Anyone who has picked these vulnerable white flowers with their receiving blanket leaves cradling the stem, knows the plant might have as easily been called bloodstem. The red-orange stain that seeps out of the broken stem is found throughout the plant and was used by the woodland Indians to paint both their faces and their weapons, giving the plant in some areas the name Indian paint. This special secretion can be found in the plant, not merely during the transient blooming period, but throughout the spring and summer. The Indians discovered that the most

continued



Philadelphia fleabane

effective technique for extracting the dye in order to obtain the deepest color was to dig the roots and boil them in water with the articles they wished to color.

Perhaps the surprising color was a factor in encouraging early settlers to try the juice as a home remedy for a variety of complaints. Mothers would put a few drops of the reddish liquid on a lump of sugar for a child suffering from a cold or cough. Fortunately the dosage was small because the alkaloid drugs, which come from the plants of the poppy family of which bloodroot is a member, are often poisonous if taken in large quantities. The bitter taste guarantees that no one will mistakenly chew the stem of bloodroot or lick the red syrup. No doubt the sugar not only helped soothe a raw throat, but was essential to get the bitter medicine down.

The red-orange stain that seeps out of the broken stem of the bloodroot is found throughout the plant and was used by the woodland Indians to paint both their faces and their weapons, giving the plant in some areas the name Indian paint.

good riddance

In the days before supermarket drug stores, the local wild plants were not only a convenient source of healing (even if only as a placebo) but were counted on to rid the house and garden of pests. Any plant name ending in "-bane" (such as bugbane and dogbane) would be used to try to ward off the intruders. And conversely the suffix "-balm" (as in beebalm and horsebalm) indicated that in some way, the plant was a special treat for that specific animal. And as is true with the "cure-all" names given to some plants, there might be a foundation for the name; but in other cases, the name is false (although innocent) advertising. One example of a plant that fails to live up to its name seems to be the common or Philadelphia fleabane. If the problem of fleas became sufficiently desperate, the procedure was to dry the plants with their small pink daisy-like flowers and then sprinkle the powder around the infested area. This method is reported to have affected the fleas not at all, but to have easily driven the dogs out. A second technique called for burning the dried plants, but there is no indication that this approach was any more successful.

Once you know the "bane, balm, wort" code, it is quite easy to guess the meaning of many plant names, but one that puzzles many people is our common dandelion *(Taraxacum officinale* or *vulgare).* That "dandelion" comes from the French "dent de lion" is well known, but few people work out its relationship to their sunny friend or perennial enemy (depending on your vantage point). Children have frequently told me it is a dandy lion because of the nice yellow ruff. Although some version of the lion's-tooth-name is used for the ubiquitous plant in many different countries and languages, it is not certain what part or character represents the lion's tooth. The jagged edges of the leaves certainly suggest a row of teeth, but why the lion? In medieval herbals, the dandelion was described as a wonder drug capable of curing almost any malady. Because of its reputed potency, the dandelion was likened to having the power of a lion's tooth.

Perhaps this is a plant whose name should be updated. A less common name, but one more easily understood, is blowball. Or perhaps you have a suggestion. Sunwort? Or yardbane? Depending on your vantage point.

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*All of the books listed here except the one by W. C. Stevens (out of print) can be found in the PHS Library. In addition, the library has an extensive collection of other books about wildflowers.

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For many years Nancy Rost Goulden has been a middle school science teacher who shared her interest in wildflowers and their lore with her students. At the present time she is completing her M.A. in Theatre at Villanova University. Her favorite break from studies is a walk in the woods and fields looking for flowering plants.

The Remarkable Witch Hazel Family

by William Flemer, III

For the gardener who is surfeited with the inevitable forsythias, Van Houtte spireas, and weigelas found in so many yards; for those who would like to change from the somber yews so extensively used in the average foundation plant, or who are interested in delicate but colorful flowers at unusual times of the year, there are gardening adventures in the unusual witch hazel family. It is a group of shrubs or small trees that has many remarkable and unique characteristics combined in no other class of deciduous shrubs, e.g., varied bloom times and rich fragrance. The family has been in cultivation in this country for many years, but is only now beginning to gain the attention it certainly merits, although in the more sophisticated gardening world in England and on the Continent it has long been a favorite of discerning gardeners.

Historically, the true witch hazels formed a part of the great tertiary flora that covered the northern hemisphere before the last ice age. Fossil leaves indicate that they grew and thrived even in northern Canada, Greenland, and parts of Russia where the climate today is too harsh for anything but the humblest mosses, lichens and sedges. By the time the great glaciers withdrew, the witch hazel's range had been constricted to two small portions of their former domain, one in the eastern United States and adjacent southeastern Canada and the other in China and nearby Japan. Being tolerant of a considerable range of soils and hardy to -10°F, they will thrive once more in many areas where they are not native. Although in the wild they grow as understory shrubs in wooded places, they do remarkably well in the city and are quite indifferent to smoke and dust.

Their main beauty lies in their curious four-petaled flowers, each narrow petal being gracefully twisted and curled. Really unique is their time of blooming, since one species flowers late in the fall after the leaves have fallen and the other three and their hybrids flower during the first thaws of earliest spring, sometimes even in late January if the winter is mild. These latter species often present the astounding spectacle of a shrub in full boom with snow outlining each twig. Their habit of growth, too, is loose and graceful, with slender zig-zag branching twigs. These picturesque twigs with their little clusters of blooms are especially fine for making striking flower arrangements in the Japanese style, and the plants are well worth garden room for this purpose alone. An additional point of interest is their remarkable method of seed dispersal. The hard glossy black seeds, about the size of a grain of rice, are born in pairs in little woody capsules. As these capsules ripen in the fall, they gradually split and yawn open exposing and compressing the seeds. When they have fully opened, the seeds are suddenly shot out with a clearly audible snap, and they may be shot for ten or twelve feet before falling to the ground, depending upon the angle of the capsule on the branch.

These species often present the astounding spectacle of a shrub in full bloom with snow outlining each twig.

With their open and picturesque habit of growth and interesting foliage patterns, the witch hazels combine well in the landscape picture. They cast a light, filtered shade and are tall enough so that azaleas and the smaller broadleaf evergreens grow well beneath them. One of the prize winning gardens in a recent flower show featured a large open Chinese witch hazel with an underplanting of clumps of the small leafed evergreen Carolina rhododendron interspersed with colonies of the deGraaff hybrid lily 'Destiny' (a clear yellow, erect flowering variety). A most harmonious grouping, which gives three distinct seasons of bloom.

The Virginia witch hazel *(Hamamelis virginiana)* is native to the eastern third of the United States from Canada to Georgia and is the hardiest of the genus (grows to 15 ft.). It comes into bloom in early October and is coverd with pale but clear yellow flowers. The delicate yellow mist of the flowers is most striking against a background planting of hemlock or other dark green evergreens, which also show off the bright yellow autumn foliage to good effect. These yellow fall tints are further enhanced by naturalizing a few clumps of lavender autumn crocuses or colchicums beneath the witch hazel, as both are colorful at the same period.

The vernal witch hazel *(Hamamelis vernalis)* is a winter blooming variety native to Missouri, Arkansas and Louisiana, but perfectly hardy up the coast to Boston. It is the most dense and upright of the four species (it grows to 6 ft.) and has beautiful fresh green foliage. It comes into bloom very early in the year and is sometimes seen in full bloom in January at Boston, while the ground beneath it is blanketed with snow. The petals of the flowers roll up and close during cold spells, but unfold as soon as the weather moderates and fill the air with their spicy fragrance. There are yellow, amber and red flowered strains, and although the individual flowers are small (½ in. in diameter) their abundance and fragrance are a welcome reminder that the winter solstice has passed and spring is on its way.

the oriental sisters

The Japanese witch hazel *(Hamamelis japonica*, to 30 ft.) is another spring blooming variety, which closely follows the vernal witch hazel and later the Chinese witch hazel, and is usually in full bloom in late February. The flowers are much larger than the vernal witch hazel and have wider petals of a lovely lemon-yellow shade. 'Flavopurpurascens' is a cultivar with conspicuous purplish centers and red-based petals, and 'Sulphurea' has pale yellow petals and yellow centers. The foliage of the Japanese variety is especially handsome, being a smooth almost bluish green and creased along the veins into a neat series of pleats extending the length of the leaf. The leaves turn a bright orange-yellow to red late in the fall. This variety is more widespreading than the others and the neat foliage is open enough to grow other shrubs beneath. It makes an especially handsome picture with clumps of the intensely fragrant February daphne *(D. mezereum)* planted beneath its branches. Both plants bloom at the same time and the yellow flowers of the witch hazel set off the magenta or

continued

Witch Hazel Family

continued

white flowers of the daphne. The whole grouping is still more striking if tied together with a ground cover of periwinkle *(Vinca minor)* as a dark green foil for the flowers of the two shrubs. In a sheltered location, the periwinkle often shows quite a scattering of blue flowers before the witch hazel has gone out of flower.

The Chinese witch hazel *(Hamamelis mollis,* 25-30 ft.) has the largest and most colorful flowers of the group. It too is a late winter bloomer and is usually colorful by mid-February. The flowers are almost as fragrant as the vernal witch hazel, but are much larger, 1½ in. across when fully opened. They are a bright golden yellow, and vary in size according to the temperature, opening fully on warm, sunny days, and rolling up during cold spells. The Chinese witch hazel forms a sizeable rounded plant with large oval leaves. The young twigs and leaves are covered with a dense fuzz of hairs, which are gradually shed as the twigs mature, and are present only on one year wood. Both the flower buds and seed capsules are also densely felted with orange-brown hairs.

Being also a tall grower, the Chinese witch hazel is useful as a canopy planting beneath which ericaceous plants such as the hardier Kurume azaleas, Japanese andromeda, or mountain laurel can be planted in irregular groupings. The light filtered shade that it casts, and its relative lateness in leafing out, make favorable conditions for growing colonies of such early spring bulbs as snow drops, chionodoxa, species crocus, and grape hyacinth. It combines especially well with the tiny winter aconite *(Eranthis hyemalis)* from Europe as both bloom at the same early period and the rich yellow of the witch hazel is repeated in the myriads of little buttercup flowers of the winter aconite.

Given the existence of two such handsome oriental sister-species with overlapping blooming periods, it is not surprising that much accidental and deliberate hybridization should have occurred. The cross is known as *Hamamelis* x *intermedia* and it has resulted in a number of superior varieties, most of them unfortunately little known in the United States. The best of them all for American gardens is called 'Arnold Promise' and originated at the Arnold Arboretum near Boston. It is a very dense bloomer and bears showy clouds of sulfur-yellow flowers. It is later blooming than *H. mollis* and never fails to put on a fine display, even in years when the former is spoiled by severe freezes.



photo by Gottlieb Hampfler

Hamamelis mollis

Of the orange flowered clones, the best is the vigorous 'Jelena' from the Kalmthout Arboretum in Belgium. The flowers are large and fragrant, a rich coppery orange in color, and the fall foliage is likewise orange to red. It is also listed in some catalogs as 'Copper Beauty' or 'Orange Beauty,' which are confusing but certainly more descriptive names. It is a strong spreading grower, with very broad, fuzzy leaves.

There are several red flowering clones in the nursery trade of which the best is Diane, again from the Kalmthout Arboretum. Almost as colorful and well worth planting are 'Feuerzauber' from Germany and 'Ruby Glow.' Most grafted witch hazels come from Holland, and unfortunately the growers there freely substitute one red clone for another, with the result that all three are greatly mixed up in the nursery trade and even in American arboretums. In any case, despite Dr. Wyman's caveat, the red flowered witch hazels are well worth a place in the garden. Almost all deciduous winter blooming shrubs have yellow flowers, and a splash of copper or red is most welcome.

With the gradual spread of the modern style of home architecture, there is increasing need for plants with the picturesque open habit of growth, which combines so harmoniously with the modern asymmetry. More and more frequently modern houses are designed to enclose "sun trap" areas so oriented as to permit comfortable outdoor living later in the fall and earlier in the spring than previously possible. The witch hazels, with their graceful loose branching patterns at maturity and their unique blooming habits, seem to have been specially created for blending into the modern landscape patterns and for specimen use in conjunction with outdoor living areas.

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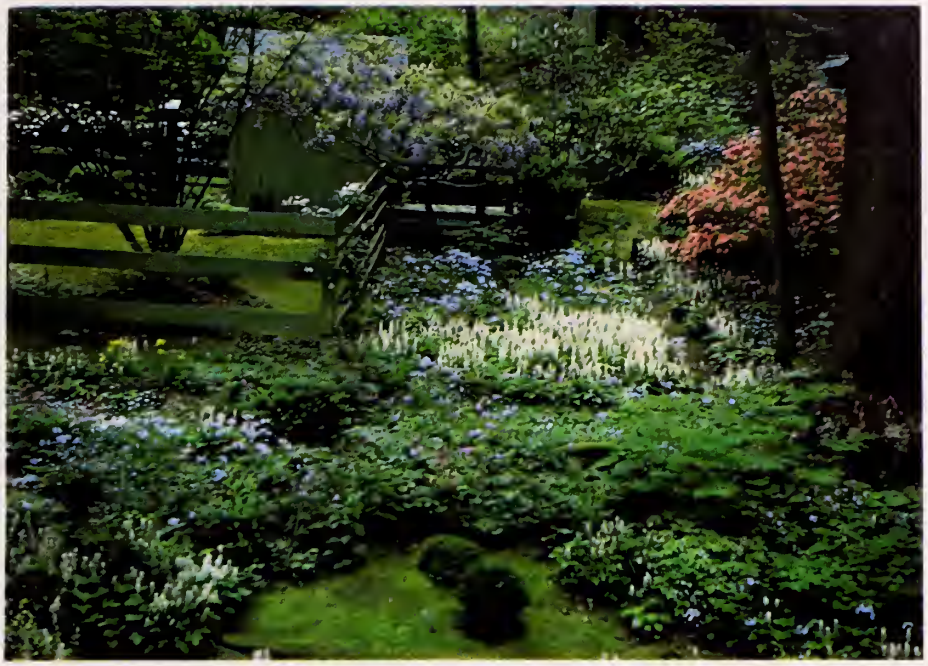
William Flemer is currently engaged in an extensive program breeding Japanese cherry trees, shadbush *(Amelancier* hybrids), and lindens. He is also working on a book on shade and ornamental trees for street tree planting.

WITCH HAZEL* BLOOM IN THE DELAWARE VALLEY

	Bloom Date	Color of Flowers
Hamamelis virginiana	early October	pale yellow
H. vernalis	January	yellow, amber or red flowers
H. japonica	February	lemon yellow
H. j. 'Flavopurpurascens'	February	purple centers, red-based petals
H. j. 'Sulphurea'	February	pale yellow
H. mollis	mid-February	bright golden yellow
H. x *intermedia* 'Arnold Promise'	late February	sulfur yellow
H. 'Jelena'	late February	coppery orange
H. 'Diane'	late February	red
H. 'Feuerzauber'	late February	red
H. 'Ruby Glow'	late February	red

*Plants mentioned in this article

photos by David E. Benner



Moss with wildflowers and other plants in author's garden (spring, 1980)



The backyard in 1971

A MOSS GARDEN REPLACES A GRASS LAWN

by David E. Benner



Portion of the backyard with moss and skimmia in November, 1979.

In March 1962, I took two giant steps in my life. The first, I got married. The second, I bought a house with two acres of land on a wooded hillside. Dreams and changes were in the air and I decided that mowing and caring for a grass lawn from spring to fall was not for me. By May, I noticed that the grass lawn around our home looked pathetic with patches of moss, ground ivy, oxalis and other weedy plants. Then came my dream, why not have a moss lawn and get rid of the grass and weeds.

My problem was how to accomplish this idea. There were no books on the subject, and no such lawn to visit, but I had made up my mind and was determined to give it a try.

Our property was an ideal place for moss to grow and spread—shade, acid soil and a moist north-facing slope. First, the two acres were more or less

continued



Moss in the front yard

divided into two parts, the one acre around the house for the moss project with the back acre of woods to be left alone. The already acid soil became more acidic when we added sulfur dust, aluminum sulfate and Miracid. In a few months, much of the existing grass simply died. Weeds were pulled out carefully by their roots after heavy rains. By fall, the moss already growing there had spread considerably. During the next few years, what little grass and weeds remained were pulled or dug out and by 1964, an attractive emerald carpet covered most of this area.

For contrast, and to fill in sections where there was no moss carpet, I planted evergreen groundcovers and native perennial wildflowers. These grew and spread into drifts of color, geared for a spring display, which is when our garden is at its most beautiful. But, the amazing fact is that the emerald moss carpet is appealing to look at all year, except in periods of drought. Then, the moss plants curl up, turn brownish, but do not die.

As I write, it is late afternoon, August 1, 1980. The weather has been hot and dry for weeks. Most grass lawns look terrible but our moss lawn is a valvety green, because we had a thundershower early this morning.

Moss is really an amazingly primitive plant. Possessing no true roots, there are root-like structures called rhizoids that anchor the moss plant to whatever it is growing upon. Mosses absorb water and nutrients through their leaves rapidly because they lack the protective coating found in most other plants. Minutes after a rain shriveled, brown moss plants will turn bright green. It's a miracle.

For 15 years, we have enjoyed this lawn. It has never had to be mowed, fertilized, watered or sprayed for insects, weeds and diseases. It is not demanding. When grass reaches a certain length, it must be cut.

problems

I have had only three problems:

- Weeding the moss. Fortunately, there are less weeds each year, and they can be removed anytime before they go to seed.
- Birds in late summer and fall sometimes pick apart sizeable clumps during dry periods in search of grubs. Such spots can be covered with screening until it rains.
- Leaf litter must be removed before winter since the moss can be easily killed by matted tree leaves. The best way to solve this is to wait until all leaves have fallen and after the ground has frozen. Then, they can be raked off with a bamboo or plastic rake.

If you have any shaded area, you can consider moss. Here are some suggestions on how to proceed. Take an average property in a shaded, woodland setting; assume that the soil is already acid with deciduous trees overhead for shade. Having a decent grass lawn in such an area is usually difficult, and often, some moss is present. Liming the soil will benefit the grass and discourage or kill the moss, but the shade factor is still a problem. By making the soil more acid, a pH of 5.5 or less, much of the grass will die and the moss begin to flourish. Three good materials to use are aluminum sulfate, ferrous sulfate and sulfur. (See chart.)

Both sulfates will change the pH of the soil in about two weeks. Sulfur takes two months or more. Spread the materials on the soil in early spring or summer. Remember it takes time and patience—several years until you really see results.

Moss can also be transplanted but it is not easy and must be done at the proper time. Early spring seems to be best, about the end of March or April when the weather is cool and the soil continually moist. In moving clumps of moss, be sure not to leave air spaces between the plants and the soil and to keep them well watered for several weeks.

Over the years, I have added dwarf conifers, more evergreen shrubs, two rock gardens, a small waterfall and many other plants. All of this plant material has been carefully selected for foliage color, flowers, fruits, growth habit, texture, fragrance and edibility. My latest favorite deciduous shrub is *Clerodendrum trichotomum,* which is now 8 ft. tall with fragrant white flowers in summer.

My dream in 1962 has become not only a reality but a gardener's paradise of year-round beauty. As groundcovers and other plants spread and flourish, there is less maintenance, and more time to really relax and enjoy our woods and gardens.

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David Benner is an assistant professor in the Horticultural Department at Delaware Valley College, Doylestown, Pa. For 10 years, he was the botanist at Bowman's Hill Wildflower Preserve, Washington Crossing State Park, Pa. He has just had an article about his moss garden published in *Garden,* a national magazine published by the New York Botanical Garden. Benner is a consultant for naturalistic plantings for shady locations and a lecturer.

To change pH		Pounds of material per 100 square feet		
Start	Desired	Aluminum sulfate	Ferrous sulfate	Sulfur
8.0	to 5.5	13.5	25.9	5.5
7.5	to 5.5	11.5	23.5	5.0
7.0	to 5.5	9.0	16.5	3.5
6.5	to 5.5	6.5	11.8	2.5
6.5	to 5.0	10.5	18.8	4.0

TISSUE CULTURE: Micropropagation and Disease Free Plants

by Randall Niedz

Concepts as radical to the world of plant propagation as test tube babies are to human reproduction.

There's a good chance that your favorite tree, flower or vegetable may be a product of biological manipulation. Plant breeders, horticulturists and geneticists are using many fascinating techniques, including genetic engineering, to improve plant life.

Research in plant cell and tissue culture is controversial, as well as one of the most exciting and promising fields in experimental biology. Test tube cultures are used as tools to study basic problems in plant physiology, cell biology, genetics, agriculture, horticulture, forestry and industry. Because of cell and tissue culture our understanding of all aspects of cell life has increased significantly. Plant cell and tissue culture involve isolating a plant part and aseptically placing it into a container, for example, a test tube with a nutrient, and controlling the environmental conditions (e.g., quality and quantity of light, temperature, humidity), to get the plant cells or plants to multiply more rapidly. Almost every plant part can be used in this process: shoot tips, side buds, stem sections, leaf sections, reproductive parts like pollen or seeds, as well as isolated cells and even protoplasts (plant cells without walls).

The two areas where tissue culture techniques are commercially used to the greatest degree are rapid multiplication systems and the elimination of disease from bacteria, fungus, and virus infected plants.

rapid multiplication systems

Another term for rapid multiplication systems is micropropagation, which is just a fancy word for a very small cutting. The idea is to obtain as many plants as possible in a given length of time. A plant part is placed on a nutrient medium and will form a single plantlet or many small plantlets depending on the nutrients and growing conditions. A tomato leaf can be cut into several small sections and each section will form six to twelve plantlets. The development of a plant part while in culture is generally divided into three stages. Stage 1 occurs after the explant (tissue culturist's term for plant part) is transferred onto the nutrient medium. The explant enlarges. Stage 2 is the production of roots and/or shoots from the explant. Stage 3 is when a new plant is produced that can grow on its own when placed into soil.

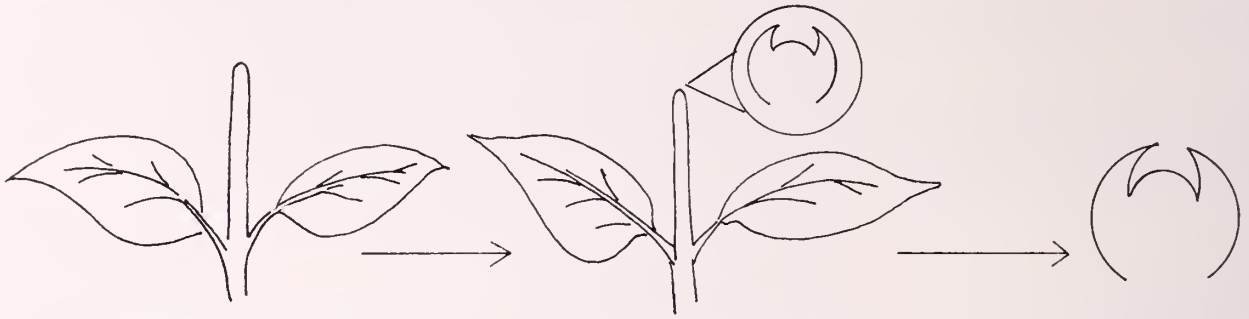
By using micropropagation one retains all the benefits of traditional propagation techniques while greatly increasing the numbers of plants obtained. Tissue culture technology for example applied to orchids has produced quality plants in large quantities, and of uniform likeness. This technique is valuable since the normal method of vegetative propagation by offshoots is very slow. In some orchid types (dendrobium, cattleya, cymbidium) the culture of shoot tips results in the formation of bulblets; a stage between seed germination and developed seedling. These bulblets can be multiplied by dividing them into quarters. Increase in the number of bulblets is extremely rapid (quadrupling every 10 days). Many common foliage plants such as rubber trees, dieffenbachias, weeping figs, and ferns are also produced in large quantities through tissue culture techniques.

Another benefit of micropropagation is that the large scale growers costs are reduced. However, unless a grower can handle thousands of plants per week, micropropagation will be more costly than standard procedures because the

continued



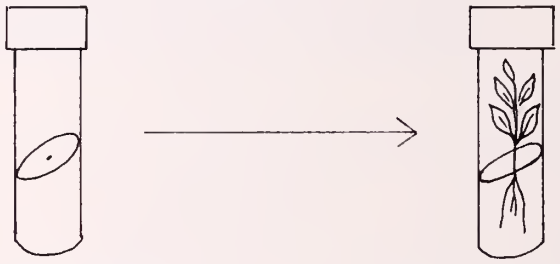
Several tomato plants regenerated from a piece of leaf slightly smaller than a dime. A good example of micropropagation.



A. A cutting of a plant to be screened for disease-causing organisms.

B. The extreme tip (meristem) is exposed with the aid of a microscope.

C. The meristem, about the size of a period on this page, is removed.



D. The meristem is placed into a test tube on nutrient medium.

E. A disease-free plant regenerated from a tiny meristem.

greatly increased number of plants must be sold to offset the high production costs (lab equipment, trained personnel, etc.).

disease free plants

Producing disease free plants is simply a variation of the rapid multiplication system. It is micropropagation as applied by the plant pathologist. Many commercial crop plants, particularly those propagated vegetatively, contain internal bacteria, fungi and viruses, which affect the yield and frequently the quality and appearance of the saleable item. When plants are freed from these host organisms commercial value increases significantly because of a comparable increase in quality. Increased vigor, more prolific branching, more shoots terminating in flowers, earlier flowering, and denser foliage are not uncommon traits when debilitating organisms are removed. It is therefore in the best interest of a grower to eliminate these organisms. In most cases the grower who produces the best quality commands the best price.

The standard technique used to get rid of unwanted organisms (e.g., viruses, fungi and certain bacteria) is meristem culture. The process works this way. A plant is composed of actively growing shoot tips. The region of the shoot tip that actually does the growing is only a fraction of a millimeter long; it is called the meristem. The meristem is always growing or elongating and, therefore, always a bit ahead of unwanted organisms who in a sense are playing catch up. What this means is that the very tip (about 0.2 millimeter or the equivalent of 1/5 of a period on this paper) should be free of pathogens. If these tiny tips are free of pathogens and if we have the technology to regenerate a complete plant from such a small cutting, then it should be possible to obtain disease free (or pathogen free) plants by just growing these tips—and it is. Sometimes heat treatments are used before cutting the tip and placing it into culture. This procedure is widely used in strawberries to eliminate certain viruses. Infected plants are heat-treated at 104° to 106°F for four to six weeks, then the meristems are removed and placed into culture.

Once we have a plant derived from a meristem we can test to see if it is free of unwanted organisms or, in other words, "clean." Of course we could ask how we knew it was infected in the first place. To test for the presence or absence of a particular "bug" we use two methods, one for viruses and the other for bacteria and fungi.

virus detection

A virus can be identified by two methods. One, if the virus causes specific symptoms, it can be identified by simply looking at the plant. However, some plants or varieties tolerate certain viruses and present no symptoms. They require the use of an indicator plant. An indicator plant is extremely sensitive to the virus in question and shows characteristic symptoms when infected. By taking a leaf from the plant being tested and rubbing some of its juice into the leaves of the indicator plant, one can determine in a few weeks if the initial plant is free of that particular virus. Another variation of this technique is to graft or bud tissue from the test plant to the indicator plant, which will later produce recognizable symptoms. If the tissue is infected, the virus will travel across the graft union to the indicator plant. Some of the cultivated strawberries are tolerant to viruses and even though infected show no symptoms, but yield may be decreased. However, the wood strawberry, *Fragaria vesca,* is sensitive to viral infection and is used as an indicator plant.

bacteria and fungal detection

When testing for bacteria or fungi the tissue culturist need only take a small piece of the plant, squash it and



Testing two plants for disease-causing organisms. Sample of plant to be tested is placed onto a nutrient medium, which will allow the growth of disease-causing organisms. Plate on the left shows an infected plant and the plate on the right show a "clean" plant.

place it onto a nutrient medium conducive to the growth of bacteria or fungi. If, after a week or two, nothing appears on the medium the plant is considered free of the tested pathogen. When plants are free of unwanted organisms, viruses, bacteria or fungi, it is a simple matter to propagate them using either standard methods or micopropagation, whichever is more economical.

commercial impact

The use of pathogen or disease-free plant material has only occurred in the past few years. The research in this field has brought major advances in plant propagation. Food crops for which control programs are in operation in varying degrees include potato, strawberry, citrus, grape, and several tree fruits and nuts. Ornamental crops where disease control is practiced include carnation, chrysanthemum, lily, gladiolus, rose, flowering *Prunus* species, and orchid. In propagating and maintaining these plants, such procedures have become standard operations, and high-level production of many of these crops would be impossible without them.

Not only can tissue culture techniques produce a higher quality plant through the elimination of disease, but it allows for the free exchange of plant material between countries without the risk of introducing new organisms from one country to another. Contaminated plant material is responsible for some of our most devastating diseases, e.g., Dutch elm disease. This disease which has been reducing the nation's American elm population drastically, came to this country from Europe via contaminated plant material and to Europe from Asia via contaminated plant material. Tissue culture eliminates this problem.

As tissue culture techniques are devised and refined, an increasing number of important agricultural and horticultural crop plants will be subject to improvement through the production of disease-free plants, and difficult to propagate plants or plants that propagate very slowly will be readily available to all through the technique of micropropagation.

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Randall Niedz, of Spring House, Pa., completed his undergraduate work at Pennsylvania State University in the spring of 1979. He is currently a graduate student at Michigan State, majoring in plant breeding and genetics. His area of interest is protoplast fusion, a form of genetic engineering, which will help to increase plant yields, develop disease resistance, create novel forms of plants and increase their nutritive value.

A Grower Discusses Practical Application of Tissue Culture Propagation

In a telephone interview, Carl Fetzer, proprietor of Fetzer Greenhouses of Hartsville near Warminster, said he thought it would be a long time before the impact of tissue culture propagation would be felt in the industry.*

"Right now," he noted, "our laboratory has to produce 10,000 plants a week just to break even. Tissue culture propagation is a labor intensive process."

Fetzer's experience with tissue culture propagation goes back 16 years, when they first had cymbidium and cattleya plants propagated in France. "This method enabled us to pick the best plants for uniform and predictable cut flower production. For example, it made planning for holiday production a lot more reliable." At present, however, orchids constitute only 40% of Fetzer's sales volume to wholesalers; of that only 50% of the orchid stock was propagated through tissue culture. And these are now propagated locally. The other advantage that Fetzer sees is that while the methods they use do not guarantee disease-free plants, they are generally cleaner than when other propagation methods are used. Other advantages are that production schedules are more manageable and you are not at the mercy of air freight handling when you have to import from Europe.

Four years ago, Fetzer began massive in-house tissue culture operations when he shifted emphasis from orchids to foliage plants, which were then going through a boom period. He was quick to point out, however, that not all plants do well with that method of reproduction. Mainly they use tissue culture propagation for their Iron Cross begonia *(Begonia masoniana)* and they have used it in the past for Rex begonias. African violets are bushier when this method is used, and the spathiphyllum branches more. "It's easier and cheaper, however," he adds, "to reproduce plants like peperomia, ferns and the lipstick plant from cuttings."

*[Ed. Note: Tissue culture is currently essential in agriculture; it is also used more frequently with some plants than with others.]

Azalea seedlings two to three months old



Growing Deciduous Azaleas from Seed

Now is the time to begin collecting seed

by Elizabeth Morrow Urffer

Several years ago, in early spring, I stopped at a neighbor's to ask the name of a shrub with enchanting pink blossoms that I had never seen before. It was *Rhododendron schlippenbachii,* the royal azalea. This incident and my subsequent interest led me to Lucinda Iliff, a woman whose garden abounded with numerous varieties of deciduous azaleas. To see them in bloom was a wondrous experience. But what was even more remarkable was the fact that all of these shrubs had been raised from seed by Iliff and her sister, Cynthia Koehler.

Armed with information generously given me by Iliff and some years of experimenting on my own, I now want to share these successes. I've had a high germination rate with many kinds of deciduous azaleas as well as a few other kinds of acid-loving plants, using the method outlined here.

For me the experience of growing deciduous azaleas begins in the autumn, when the seed ripens. I watch the seed pods turn from green to brown and then pick them before the pod opens and the seeds scatter. Although the time varies each year, the seeds are usually ready around Thanksgiving in the Delaware Valley. Part of the fun is to watch the flower of a favorite azalea develop into a capsule and to mature. Although azaleas naturally hydridize with other varieties that flower at the same time, the results are usually compatible and the flowers interesting.

You begin collecting seeds by picking the seed capsules on a dry day, if possible. Bringing them indoors and spreading them on newspapers or individual dishes for a few days allows any exterior moisture to evaporate. At the same time remove any leaves and any mildewed or diseased capsules. Usually the heat of the house will cause the capsules to open and the seeds to pour out. Store the seeds in small jars or envelopes. Remember to write the name of the variety on the container.

Since the azaleas will need a lot of space when they are transplanted in three or four months, I find that it is best to wait until late January to begin my project. During this quiet time I collect and organize all the things that will be needed. These include milled sphagnum moss, a clean clear plastic box with a lid, and the seeds. Also, for later use, I check over my fluorescent lights and wooden boxes or seed flats.

Some people may become discouraged when they hear that from seed germination to the time the plant flowers is generally from 5-8 years.

First, I soak the milled sphagnum moss for a few hours or overnight. I wring out excess water and press the moss into the bottom third or half of the plastic box. It is strange that drainage holes are not necessary for the first few months. The seeds are then sprinkled over the moss and pressed down gently. (For ease of handling, the seeds can be tapped from the corner of an envelope or a folded piece of paper.) Place the lid on the box, which then becomes a terrarium and eliminates the need for watering. Be sure to tape the name of the species on the box.

Until germination no bright light is needed, but bottom heat is important. I place the plastic box on a cardboard box, which rests on the radiator. The thermostat varies from 58° to 70°. Perhaps, in your home you will have a different way of getting some bottom heat.

the need for light

Usually in two to four weeks the seeds will begin to germinate. At that time the seedlings require a lot of light. I move the plastic box under fluorescent lights—one cool bulb next to one warm bulb. The seedlings are placed about 8 in. from the lights for 12 to 14 hours each day. (Iliff begins her seeds in March or April so that windowsills with southern exposures will ensure adequate light for the seedlings. She rotates the flats on the windowsills for maximum sunlight.)

It is best to check the seedling box each day. Use a pin or tweezers to remove any seeds that develop mold. Also, remove any seedlings that are growing on top of each other to ensure enough space for the remaining seedlings.

When the seedlings have formed their first true leaves and the seedling box is becoming crowded, it is time to transplant. This will probably be in late May. The seedlings should be gently "pricked out" by holding the leaves, not the stem and moving into the wooden flat. During this period of a seedling's development, a "leggy" plant can usually be planted a little deeper in the soil than it was previously growing.

For the soil mixture I use a handful of moist sphagnum moss with equal amount of perlite, sterile soil, and sand. If possible, water the seedlings from the bottom by setting the flat in a large tub of water. For a few days place the flat in the shade. If the leaves of the seedlings curl or wilt when the flat is

photos supplied by author



Plum leaved azalea *(Rhododendron prunifolium)*



Pinxterbloom azalea

returned to the light, take the flat out of the light for a few more days. Now that the azaleas are out of the enclosed plastic box, they must be watched more closely so that they do not dry out.

The flats can be moved outside into a semi-shaded area that is protected from the wind when all danger of frost has passed. Watch the plants carefully, especially during a dry period so they don't dry out. A little mulch makes it easier.

The first winter outdoors is a challenge in our Pennsylvania freeze-thaw winters. I try to keep the flats as protected as possible by sinking them into a hole that has been dug for them in a protected area. After frost a mulch is placed over them. I use salt hay.

The following spring keep watching the plants to see how they made it through the winter. Sometimes the seedlings seem particularly late in leafing out but don't give up hope because little buds will suddenly appear on those dead looking twigs.

When the little azaleas are transplanted into the garden, choose a semi-shaded location protected from the wind. Under oak trees is ideal. But planting them under a deep rooted tree or homemade shading structure will do.

Acid soil with good drainage is important. If you are uncertain that these qualities exist, mix peat moss and sand or perlite into the surrounding soil. Also, mulch helps to increase the survival rate by decreasing the amount of weeds and keeping the plants from drying out.

Some people may become discouraged when they hear that from seed germination to the time the plant flowers is generally from five to eight years. Although this is an exciting event when it happens, it is only a part of the plant's development. For me the excitement is in the total experience. It is finding the seed, planting it, and watching it germinate and develop. You would probably enjoy the experience too.

Sources

The American Rhododendron Society has an excellent seed exchange for its members if you want to grow a specific cultivar. For information, write:

Fran Egan, Executive Secretary
14635 SW Bull Mountain Road
Tigard, OR 97223

Other seed sources include:

Barnhaven Primroses and Rare Flower Seed
15621 Auburndale Avenue
Livonia, MI 48154

George W. Park Seed Company
Greenwood, SC 29647

F. W. Schumacher Company
Sandwich, MA 02563

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Elizabeth Urffer studies horticulture at Temple University Ambler Campus and is a home gardener. She is a former children's librarian with the Philadelphia Free Library. She has had some work published in the *New York Times* garden section.



A Heating Tip for the Wise Amateur Greenhouse Owner

by Phyllis Williams

Have you ever given away plants and seen them perform better for their new owner? Have you ever wondered why your begonias stopped thriving after you built your greenhouse?

That's the way things were for us for 12 years. By the winter of '78 none of the plants was flourishing and when the blooming stalks on the orchids turned brown and limp we knew we had escaping gas. Orchids are the canaries of the plant world.

The gas man couldn't find the leak and suggested new overhead hot air gas heaters. The trouble-makers were the no-vent gas heaters recommended by the greenhouse manufacturer.

Luckily we have a relative who knows about these things, and he suggested a firm of heating experts. We called them. They were polite and prompt, and they saw the problem at

Orchids are the canaries of the plant world.

once. The old heater was leaking gas through the heat exchangers. The experts measured, pondered heat loss and suggested a circulating pump and small fin-type radiators in a double row around the greenhouse walls hooked up to the hot water heater. We knew by then that plants didn't like hot air heat so we decided to switch.

October came and the new gas heating system went into operation. By November we could see that things were looking up. January and February proved it. The place was a blooming jungle. Even plants we thought we could never grow blossomed and bloomed. The happiest surprises of all were the heating bills.

The degree days from November to April were similar to those of 1978-79. Yet the gas bills were much lower. We will save enough in the first few years to pay for all the changes. And now we have clearer consciences about our energy consumption.

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Phyllis Williams grows plants in the greenhouse to bring into her home. She likes a variety of plants and at present is enjoying experimenting with a collection of brunfelsia. She's always looking for plants with fragrance.



Lichen Paradise in the Pine Barrens

by Albert List, Jr. with Marjorie Egee

When our research team from Drexel University began to examine lichens in the Pine Barrens of New Jersey we found a lichen paradise. Naturally, we looked for them at the same time in the parks and on old stone buildings around Philadelphia. The pickings were altogether sparse. We discovered a lichen desert. Once plentiful in the city, very few lichens have survived sulfur oxides and other air pollutants. Lichens absorb and concentrate these substances and may die within a few months of exposure.

What are the lichens? Early investigators of their structure well over a century ago thought that they were fungi, and imagined that the green or blue-green cells interspersed within the tangled fungal weft represented reproductive bodies of the fungus. After much dispute, investigators finally realized that the green or blue-green cells were a different organism altogether. They were algae. Today we recognize the symbiotic relationship between the tiny algal cells and the fungus. The alga supplies organic molecules manufactured by photosynthesis, and the fungus provides an encompassing matrix around the algal cells. The fungus seems to have the better part of the bargain, for it cannot develop as a lichen without the alga, while the green or blue-green alga can get along quite well by itself. The fungus in many lichens sends little tubes into the algal cells as if it were parasitizing the alga. Such algae are not eliminated from the lichen, however, for the cells keep multiplying and outpace the fungi's mild parasitism. We need to know more about the chemistry of the lichens. To be sure stranger partnerships excite the curiosity of the botanist or gardener, yet someone must take up the cry for the vanishing lichens.

The lichens flourish in direct proportion to the purity of the air. A saying goes "The cleaner the air, the longer the lichen." That means that the longer species of lichen are found where the air purity is greatest. We have had a splendid opportunity to visualize the change in air purity in terms of lichen growth, while traveling repeatedly from the Camden-Philadelphia area to the heart of the Pinelands, just 30 miles to the east. During our many field trips, we have all become aware of the increasing presence of lichens on the white sands and on the sides of scrub oaks after passing the westernmost limits of the Mullica River at Berlin and Atco. By the time we had reached Atsion Lake at Route 206 the lichen flora was still more abundant. A few miles further down a sandy road (full of sand traps) on the southwest side of the Mullica, and we had reached a lichen paradise. Paradoxically, the desert-like sands, strewn with litter often as dry as tinder, house a rich diversity of lichens. The tree trunks in certain places are heavily covered with them. Lichens even occur on the branches of some of the ancient highbush blueberries.

Lichens do not do well in terrariums, since they cannot tolerate high and continuous humidity. They become covered with invading molds (other than the one in the lichen) and die.

heather hill

In the course of our research in the Wharton Tract we discovered some low sandy hills, denuded of trees. We named one of these "heather hill" because of the *Hudsonia ericoides* (false or golden heather) that is so abundant there. Also abundant on our hill is the longroot, a cushion plant also known as the Pine Barrens sandwort *(Arenaria caroliniana)*. During the last two years we have measured the growth rate of these low mounded plants, and studied the microscopic mites and springtails that make up a part of the sandwort community. Dispersed among the false heather and the sandwort we could not help but tread upon the ubiquitous antlered lichens that are anchored to the sand and bind the grains of quartz together. In the early morning dew these low lichen cushions were as soft as wet bath sponges. In the heat of the midsummer sun they became as brittle as icicles. The myriads of tiny fragments that we must have kicked loose reproduced these organisms. This cloning is one of the several ways that lichens reproduce. Gradually we became aware of the great variety among the lichens. I recall our surprise when we discovered a lichen that looked like puddles of tar dappled here and there on the sand. As botanists, of course, we were already aware of the vast worldwide distribution of lichens. They are important in the arctic tundra as food (reindeer lichen and Iceland lichen), yet they range all the way into the tropical rain forests where they may grow high on the branches of trees. They may even give protective coloration by growing on the back of beetles. Nevertheless, we were not prepared for the lichen diveristy in the Pinelands.

Just over 20 years ago at Atsion, heather hill was devastated by a raging fire that reduced even the largest pitch pines and scrub oaks to charcoal. The hill has been bare looking ever since. The slow growing sandworts have formed hundreds of islands in the sand, and the lichens have formed mosaic patterns in between. Once again fire struck in the dry spring of 1977, but this time heather hill was only slightly singed, being barred of trees and shrubs. The variations in the fire's intensity created an even more complex mosaic of vegetation in a large region along the southwest side of the Mullica River near Atsion. Shrubs resurged from tough rootstocks. The sprouts on the

continued

photos by Albert List, Jr.



Heather Hill, showing false heather, sandwort, lichens, with pitch pine and scrub oaks in the background. Taken in late November.

blackened pitch pines made them look like bottle brushes, and the blackjack oaks put up vigorous shoots with large robust leaves. Many regions remained with no live trees or shrubs. Now open to intense sunlight the bare areas of open sand became territories for conquest by lichen dust, the *soredial* particles (reproductive package) that brush off at a touch from some of the lichen species. In some of these barren regions the seeds of the ubiquitous sedge, *Carex pensylvanica,* germinated and created lawns. In other wetter places standing closer to water table level the opportunist haircap moss, *Polytrichum juniperinum,* carpeted the region. The capsules of this moss release clouds of fine powdery spores that travel on the wind.

Within a year of the 1977 fire there were few patches of open sand remaining, and the lichens had retained their claim on heather hill. They will stay there for quite some time, impeding the less aggressive herbaceous plants, and the shrubs.

We were fascinated by this paradise of lichens. We could walk in any direction from heather hill and find a new and random permutation of the lichen theme. In areas that had not been burned for a long time, a medley of lichens almost beyond belief had grown up the sides of the oak trees. Even



Pseudoparmelia caperata, one of the foliose lichens on an oak tree base.

walking slowly is too fast a rate for the careful examination of the lichens. You should crawl along the ground, or sit next to a tree and peer through a hand lens. Then you will begin to see their fascination. They are at their best after a rain. In dry times you can take a spray bottle and wet them down if you want to see them expand from their shriveled and dull form, to a glowing and robust exterior.

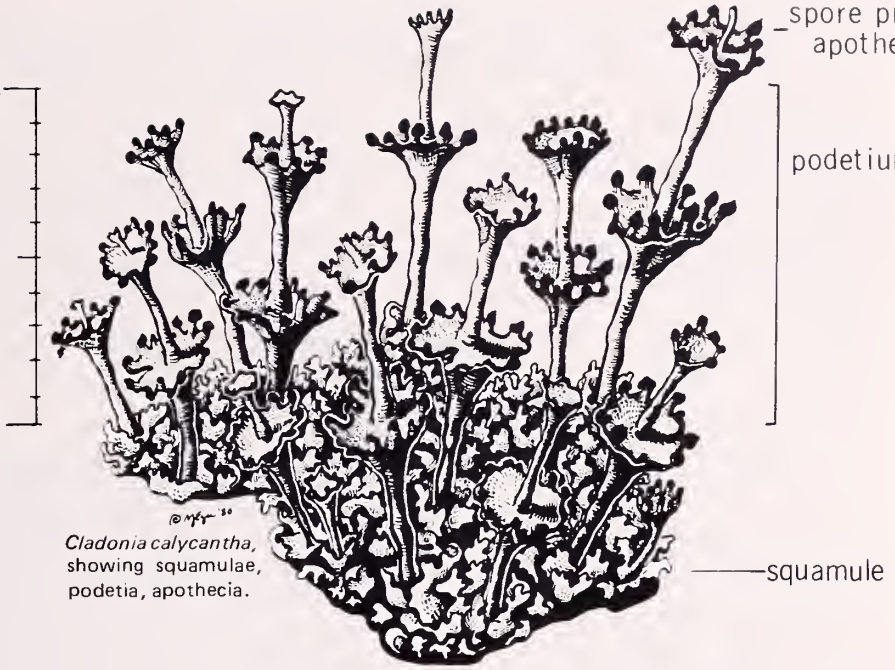
identifying lichens

Should you use taxonomic keys to determine the names of the various lichens, you will find that their identification is based on a unique set of terms unlike those used for other groups of plants. Fruticose lichens occur as little pronged horns, springing up from flat



art by Marjorie Egee

Cladonia uncialis.



Cladonia calycantha, showing squamulae, podetia, apothecia.

lobes, the *squamulae,* that lie on the sand or on the base of tree trunks. *Crustose* lichens, such as tar lichens, are tightly adherent everywhere and form rough granular masses. *Foliose* lichens are found on tree trunks and branches and anchor themselves with little *rhizines* (like rootlets) but spring free at their margins to form curiously shaped lobes. They appear like shields or targets on the bark.

Marjorie Egee, the plant illustrator, discovered among the fruticose forms a world that resembles the underwater world of the coral reef. She has illustrated two of the most common forms in the Pinelands for our article. First there is the little cupped *Cladonia calycantha.* The drawing shows the lobed "sod flakes" or squamulae at the base, and the upright stalks called podetia which are usually hollow. At the rims of the cups there are little knobs known as *apothecia.* Embedded in the surface of such apothecia are microscopic sacs that contain spores. A microscope is required to see these spores produced by the fungus as a consequence of sexual reproduction. When the spores are released they are carried by air currents to distant sites where they must recombine with the appropriate type of algal cell, in this case one of the green algae. The success rate of such a reunion is not known, for it is difficult to follow the fate of spores in nature.

Egee has also drawn the dramatic, almost dancing form of *Cladonia uncialis,* a lichen that forms bright yellow-green bushy masses on the sand. These are not much more than an inch or two high and are about the most common lichen in the Pine Barrens. In keying out this lichen back in the laboratory we noticed the shiny exterior of the podetium, while lining the hollow interior we found that the cells were brightly fluorescent under the ultraviolet lamp. The fluorescence is due to one of a number of strange organic compounds known as lichen acids. The identity of these acids often provides the final clue to the name of the species in the taxonomic key.

Finally, the foliose lichen, the yellow green *Pseudoparmelia caperata* on the trunk at the base of a white oak tree, are shown on this page. This lichen has no podetia and rarely forms apothecia. As if to compensate, it is covered all over the middle of the *thallus* (body structure) with densely crowded knobs, *soredia,* best seen under a ten-power lens. These are asexual reproductive structures that break off, carrying both algae and fungi with them to a newly invaded territory. It is certain that most of them die. Yet they are ever present and awaiting the precise conditions for reestablishment of a new thallus.

Understandably it has been an exciting year for us, discovering the lichen riches of the Pine Barrens, and it is not without a considerable wistfullness that we survey the sad fate of lichens in and around the big cities. It has been many decades since lichens have flourished near the major cities. New York City has not had any of the larger lichen forms since the last century.

If you want to study and identify lichens we recommend *How to Know the Lichens,* by Mason E. Hale (Wm. Brown, Publishers, 2nd. edition). It contains taxonomic keys and references to books and papers. A resurgence in lichen studies has arrived with the current ecological concerns over power plant siting, and extensive surveys of lichens have been made in such states as Maryland. As these studies appear in published form we will begin to learn how good or how bad the lichen situation is.

We want to make a plea for the protection of such lichen paradises as the Pine Barrens. Lichens do not do well in terrariums, since they cannot tolerate high and continuous humidity. They become covered with invading molds (other than the one in the lichen) and die. Since many of them are becoming rare and are vanishing at such a great rate in certain areas of the Pine Barrens, they must be protected. Lichens and plants, or animals for that matter, should not be removed from state forests without explicitly written permission from the superintendent, and then only in judicious small quantities for study and scientific purposes. Deliberate or unwitting abuse of these plants hastens the eradication of one of the most sensitive ecological components of the Pine Barrens of New Jersey, unique in a world of incredible beauty.

●

Albert List, Jr. is associate professor in the Biological Sciences Department at Drexel University. Marjorie Egee is a botanical illustrator. She studies art at DePauw University and has been accepted for graduate studies in botany at Drexel.

Stone: The All-Purpose Mulch

by Devon Reay

Stones and pebbles provide a highly decorative, easy upkeep and up-to-date way of gardening. Stones have an architectural quality; they create interesting patterns wherever used effectively, even in just a few places, according to George Taloumis, a New England horticulturist, who says, "Stones and rocks abound everywhere in nature."

They do? On the Delmarva Peninsula south of New Castle County, Delaware, where the beaches, east and west, are virtually pure sand, stones not only do not abound, they are practically nonexistent. Except for the rounded five-inch rock, the only one unearthed from a forty-acre Sussex County farm and given us by the farm's previous owner, all the stones mulching our indoor and choice plants have been collected in New England and along the banks of the Susquehanna south of Bethesda.

The Japanese have long had an inborn appreciation and understanding of stones, their character and beauty. Not of stones quarried by the hand of man, but of stones shaped only by nature, Lafcadio Hearn observed: "Until you can feel, and keenly feel, that stones have character, that stones have tones and values, the whole artistic meaning of a Japanese garden cannot be revealed to you." In Japan, a large stone selected for its form may have an aesthetic worth of hundreds of dollars.

Our approach is practical. Our appreciation of a neatly-fitted, properly constructed dry wall is largely admiration of the ability, the skill of its builder. Our outloook differs from that of the Japanese; a stone does not just lie there looking beautiful, we use it, put it to work.

Of course Japanese gardens have stone fountains and stone walks and stepping stones, but their stepping stones are raised an inch or so while ours are ground level for easy mowing.

Riverbed rocks are among the choicest stones, but these were not available when we ordered from Pocahontas, our local stone and gravel company, so we had half a ton of broken rock and half a ton of pinkstone delivered, five years ago. The pinkstone, which is about 1½ inches wide and of similar length, covers the drip line between the chrysanthemums and the brick foundation on the south and east sides of the house. This mulch keeps the bricks clean and the strip weed-free. Pinkstone, three layers deep, runs parallel to the back porch; though weeds do not grow through it, early each summer at least one summer poinsettia emerges and grows big, bushy and colorful.

The young pines and the apple trees, the white forsythia and certain vegetables thrive with stone muches. Some of the mulches are made from four (or



A granite rock wall at the base of a three year old lilac. It encloses spearmint to keep it from running over the lawn.

five) 8-in. or 9-in. flat stones set close together and at least an inch from the tree's trunk; others are oddshape and placed so that rain water runs down the roots. These roots also retain heat and reflect sunlight. Besides keeping the soil around each tree free of weeds, they retain moisture during long rainless weeks and keep strong winds from blowing the soil away. And they protect dwarf trees from the power mower and provide favorable conditions for soil bacteria and earthworms.

Our outlook differs from that of the Japanese; a stone does not just lie there looking beautiful, we use it, put it to work.

A six by six-inch or larger rock set close to each tender, just transplanted seedling, breaks the wind somewhat, if properly placed, and it may protect it from a loping setter. The stone also holds midday heat and releases it gradually during the cooler night; on a cold night even one degree benefits the plant, particularly if the temperature drops close to freezing.

Since the texture and structure of stones contrasts beautifully with colorful flowers and healthy foliage, a low and compact dry wall of irregular rocks, with the heavy ten by twelves (rocks) at the bottom, adds character to a small garden, particularly in an area where stones of any kind are rare.

Now, as I garden where no stones exist, I remember the massive flat top boulders, some more than seven feet across, that stood in our southern New Hampshire yard.

When we spaded our Bristol County, Mass., garden, we now and then unearthed an ancient and unusual brick, for instance a square one, but never a stone or a rock or even a white pebble. Then, just before we moved, our neighbor, whose driveway adjoined our north boundary, spread sandy fill to level and raise the rutted and grassy surface. Almost a week passed before we saw the rounded riverbed stones that had rolled down under our six-foot red pines bordering our yard in a staggered double row. These choice rocks were just what our vegetable garden needed.

The riverbed stones mulching our potted rosemary and crown of thorns are most colorful when wet. Except for two pink pebbles and a smooth, near-black stone, they are rough and flat and metallic green, blue, dull red and dull orange. We collected them last December from along the Susquehanna, close to the water, which was very low.

When we mulch cucumbers or tomatoes with pinkstone, we spread it over at least four layers of soaked newspaper; this smothers the weeds that sprout beneath, and within a few months becomes part of the soil.

Our exacum and fire fern, *Kalanchoe tomentosa* and *Aloe vera,* all thrive under their pebble mulches, whether they are potted on our southeast sill or summering in the garden. Some stones are highly decorative; smooth, near-pink or reddish pebbles contrast beautifully with deep green leaves, giving the plant a finished appearance. And stones enhance the striking dark red fire fern foliage.

●

Since 1973 Devon Reay has been gardening on Delmarva (the peninsula between the Chesapeake Bay and Atlantic Ocean) where she grows several different pines. Originally, she lived and gardened in southern New Hampshire; after that she gardened and grew six different pines in Bristol County, Mass. She still contributes the garden page to the *Christian Science Monitor,* has written for *Organic Gardening* and other magazines, and most recently appeared in *Herb Quarterly.*

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Wardian case houses orchids at Philadelphia Flower Show. See page 8.



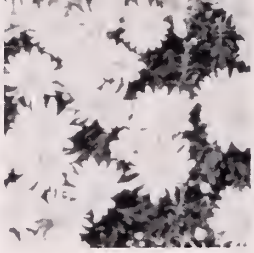
THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

JANUARY • FEBRUARY • 1981 $1.50

Getting more mileage with herbs. See page 18.


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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

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photo by Edmund B. Gilchrist, Jr.

Back Cover: Rear of Rolands' house with tulips in perennial border. See page 4.
photo by Lyn R. Haber



A Bright Torch

Thank you, Ernesta D. Ballard

"I want this magazine to be the best in the country," wrote the publisher, Ernesta D. Ballard, in 1971 to the new editor of the magazine the Society was planning to launch. That goal was consistent with everything Ernesta tackles.

PHS had just withdrawn its members' subscription for *Horticulture*, published by the Massachusetts Horticultural Society. Everyone was watching to see whether it could be replaced. Ernesta was certain that PHS's publishing venture would succeed; not everyone shared her confidence.

Green Scene, named in a contest by PHS member Mary Cornwell, progressed from the originally projected 16 pages to 36; from black and white to color, and at a meeting we had before she left, Ernesta was working to push circulation to around 10,000 from 8,000.

With all of that progress, Ernesta has never lost the intimacy that makes it work; a genuine appreciation for the contributions of individuals. For example, one day she came back from a trip to Wilmington telling about the beautiful plants she had seen being grown under lights. A year later, the grower had a story in *Green Scene* about her gesneriads and her horticultural light cart; the article was reprinted in the *New York Times* and the author was launched on a career as a lecturer and writer. Ernesta has always known members' gardens incredibly well. She told us, for example, where Doretta Klaber had tucked away the one primrose that no one else could grow as well or where the best new young horticulturists were practicing their craft, or who knew the most about azaleas or magnolias or rock garden plants. All of that added to the quality of *Green Scene.*

In addition to creativity, vision and the willingness to take a chance, the qualities that a publisher needs are those required by a fine grower: patience, understanding, discipline, commitment and the ability to work with elements beyond your control. For example, I remember the jewel-like, beautifully contrasted black and white photo of the Wissahickon Woods that we selected for the first issue's cover. The first shipment of magazines arrived from the printer and the woods looked as though they had just swallowed up Little Red Riding Hood and Hansel and Gretel. Ernesta simply said, "Check with the printer and see what happened." Mistakes had to be noted and corrected if possible; there was no drama beyond that. Just room to grow.

Besides always seeing to it that there was money to pay the bills, sharing information about the best growers in the area, giving advice about creative back up, the most significant contribution Ernesta has made to the *Green Scene* has been her work on the July single subject issues. These issues on propagation, soil, containers, basics, pruning and pests have been the most complex, and could have become cliches. I remember when we were planning the first pruning issue. Three of us went into her office, and she dismantled the subject until the essential elements were isolated and then came up with an entirely new approach. Such incisiveness demands a deep knowledge of horticulture, a sharp intellect that relates the material in a new way and an appreciation of the gardening public's needs. It's not enough to print what people want, it's important to talk about things they haven't been exposed to or thought about. She has always brought those instincts to the July issue.

We hope we will take the lessons she has taught us—authors and horticulturists—and continue to expand them. She has provided room to grow, a space to be the best we can be. She has created a true community of horticulturists in this area.

If there is one comment that sums up Ernesta Ballard's energy, work and direction, it is a quote from George Bernard Shaw. In writing about his own life's purpose, he said: *This is the true joy in life, the being used for a purpose. . . the being a force. . . instead of a feverish selfish little clod of ailments and grievances complaining that the world will not devote itself to making you happy. I am of the opinion that my life belongs to the whole community, and as long as I live it is my privilege to do for it whatever I can. . . I rejoice in life for its own sake. Life is no mere "brief candle" to me. It is a sort of bright torch which I have got hold of for the moment, and I want to make it burn as brightly as possible before handing it on to future generations.*

Ernesta would not express it that way, but the statement reflects her accomplishments. And, we know, her accomplishments to come.

The Editor

A Woodland Garden

by Jane G. Pepper



photo by Lyn R. Haber

Rear of Rolands' house with azaleas and dogwoods

Everyone told them they were crazy when they decided to build their house under a 100-ft. tulip tree and a red oak leaning precariously Tower of Pisa style. The Rolands had decided, however, to live in the woods. For years Lucille Roland had dreamed of a woodland garden and after months of searching in suburban Philadelphia she and her family finally found the ideal spot. The overhead canopy was tulip trees, oaks and beeches. The middle layer was a mass of dogwoods. The house they had in mind was to be of simple design and as unobtrusive as possible in the woodland.

With the architect the new owners paced endlessly around the lot carefully marking a few trees that had to be removed to accommodate the house. The leaning oak and tulip were left because they were to play a vital role in the landscape surrounding this house in the woods. The architect was directed to plan the front of the house around a large dogwood. He was also asked to make a suitable planting bed and a hole in the roof so they could incorporate a shadblow by the front door. Inside, the Rolands asked for a hole in the living room floor to install an indoor garden.

Inch by inch Lucille Roland advanced into the woods.

Twenty-six years later the Rolands are still enjoying their woodland hideaway. The leaning oak and the tulip are pruned every three years to keep their canopies light. The original dogwood by the front door died, but they were able to replace it and the shadblow serves as a green sentinel by the entrance. The garden, however, has changed. Initially Mrs. Roland concentrated on the area immediately surrounding the house. She planted azaleas and rhododendrons along the driveway and installed some extra screening between the house and the street.

With these necessities completed, the gardener's fingers itched to start on the woodland. Her family objected because they said she would spoil their natural woods. Luckily she persuaded them, like the eighteenth century gar-

continued



photo by Jane G. Pepper

Iris cristata and *Galium odoratum*



photo by Lyn R. Haber

Winter at the house in the woods

A Woodland Garden continued

den designers in England persuaded their clients, that she could improve upon nature. Gradually the poison ivy, wild grape, and honeysuckle were removed and some of the large trees thinned. Inch by inch Lucille Roland advanced into the woods. First she cleared paths and covered them with pine needles donated by a generous neighbor. She designed these paths to wander through the woodland so the visitor is constantly surprised by small vistas, a special conifer located in front of a beautiful rock or a patch of unusual groundcover at the base of a tree. The ultimate surprise in the woodland is the waterfall. As you wander through the trees you can hear it gently splashing—finally you come upon it carefully tucked away among large rhododendrons.

The ultimate surprise in the woodland is the waterfall. As you wander through the trees you can hear it gently splashing—finally you come upon it carefully tucked away among large rhododendrons.

One Sunday Mrs. Roland read an article in the *New York Times* gardening section about Guy Nearing, a rhododendron specialist in northern New Jersey. She and her husband made several trips to Nearing's nursery to select rhododendrons and azaleas that would provide them with a long period of spring bloom. They chose mainly pinks and whites and incorporated a few orange and yellow deciduous azaleas in the sunniest locations.

Once the shrubs were in place Mrs. Roland became fascinated by wildflowers and groundcovers that thrived in the rich woodland soil. From March through June there is a parade of bloom in the woodland. Jack-in-the-pulpit, mayapples and violets appeared naturally after the Rolands cleared the vines. Gradually they added the small flowers of early spring—bloodroot, rue anemone and snowdrops. Later the ground is covered with trillium, foamflower, primrose and sweet woodruff. Fortunate is the visitor who arrives



photo by Edmund B. Gilchrist, Jr.

The transition from the Rolands' woodland garden to their cosy living room is helped by their indoor garden. Your eye flows from the woody plantings outside to the tropical plants indoors. When the house was built Mrs. Roland directed the architect to leave a triangular shaped hole in the corner of the living room floor. Into the soil she sinks container-grown dieffenbachias, gingers, marantas and fiddle-leaf figs. Seasonal color is provided by chrysanthemums, poinsettias and spring bulbs. A top dressing of peat covers all trace of the pots. Lucille Roland waters the bed heavily two or three times a week with a hose attached to a faucet installed in the bed. Plants are put outside during the summer and sprayed carefully before being returned to the indoor garden. The occasional insect infestation has been reluctantly treated with Isotox.



photo by Lyn R. Haber

Tiarella cordifolia (foamflower) with ferns

when the wild blue phlox is in bloom. Its blue flowers blend beautifully with the warm grey trunks of the beech trees. In high summer the Roland woodland is cool and peaceful. Ferns provide textural contrast with the shiny-leaved European ginger.

Between the woods and the house Mrs. Roland has developed a satisfying perennial border. She has used a small selection of plants but they are carefully chosen to give a maximum season of bloom. Early spring is a riot of tulips, forget-me-nots, alyssum, candytuft and dark purple dwarf iris. In May the peonies—both herbaceous and tree peonies—bloom in conjunction with several varieties of astilbe. Later a selection of lilies dominate the rear of the border. Many gardeners find perennial borders unsatisfactory in Philadelphia's hot humid summers. Lucille Roland has limited herself to those varieties that she knows will perform well in her garden.

In front of the house the visitor is drawn to the bed of dwarf evergreens Mrs. Roland has purchased over a period of years from a dwarf conifer specialist in Pennsylvania. Sadly, the collector, Fred Bergman of Raraflora, has died and his collection has been sold at a series of well publicized auctions. Several of Mrs. Roland's plants, however, are being propagated by a local arboretum to preserve some of these special confiers. Through her dealings with Bergman, Mrs. Roland became fascinated by cryptomerias. Today she has about 18 species and varieties in the garden. On a spring visit you hardly notice them because the eye is attracted by the wealth of colorful flowering plants. In winter they provide excellent focal points within the woodland and their needles provide an interesting contrast with the large-leaved evergreens.

The Rolands carefully sited their house to make the most of the sun's warmth. In winter they have sun in the living room from 10 am until sunset. In summer, the deep roof overhang keeps the room remarkably cool. On the north side of the house there are no windows. Into their woodland retreat the Rolands wished to incorporate a greenhouse. It was essential, however, that the greenhouse be an integral part of the overall structure. First they asked a greenhouse construction company to help them design the greenhouse. The company was programmed to manufacture standard aluminum structures and in desperation the Rolands asked their architect to design the greenhouse. Unfortunately that was a mistake, and Mrs. Roland would advise others who plan a similar structure to secure the advice of greenhouse experts in cooperation with their architect.

In spring and early summer the Roland garden is spectacular. Later it's a pleasure to sit on the terrace and enjoy the small details that go unnoticed earlier in the year. Mrs. Roland is a careful pruner and every plant takes on an individual character in her garden. At strategic locations around the house she has used plants with flowers whose fragrance fills the interior—lilacs are by the dining room window and elaeagnus by the bedroom window. Apart from the minor problem with the greenhouse, this adventure in house and garden building has worked very well. For the Rolands the place provides a wonderful peaceful woodland hideaway. For their visitors it's a chance to see what an attractive garden can be sculpted out of a lot covered with huge trees and rampant vines.

●

Jane Pepper is the executive director of PHS.

Move All Those Plants To Chicago? How?

by Elise Felton



It was July 1979 when my husband Sam finally said yes to a job in Chicago. At that time about a thousand plants were scattered around our Haverford home. We would leave the planted gardens, but the hundreds of container grown plants had to go with me.

That summer our parking court was covered with my cactus and succulent collection. It was forbidden territory to cars and delivery trucks. The dish-gardens were on a picnic table and bench in full sun. The crassulas were also lined up on a picnic bench. Sempervivums and sedums planted in shallow containers dotted the four foot high brick wall surrounding the parking court. Directly on the black macadam, individual cactus and top-heavy succulents were lined up, baking in their clay pots. In another area, placed in pebble filled saucers, my collection of scented geraniums was displayed. In a corner with half a day of sun stood a picnic table of a dozen bonsai. Underneath in its shade hid the haworthias, aloes, agaves, and sansevierias. On the wall next to the handwrought iron gate, I kept my smallest dwarf conifers, too young to be planted in the garden. Outside the kitchen door, accessible only by ladder, perched up on the wall in single containers, were the kitchen herbs.

One hundred pounds of cement block came crashing down grazing his shin, the ladder and destroying three large panes of greenhouse. I was barely out of harm's way and lucky to be alive.

On the other shady side of the house surrounding our sitting terrace—some on the brick walls, some on the brick floor—was grouped my extensive ivy collection. Each *Hedera helix* was a different cultivar. Around Ned Hoffman's bronze fountain were grouped the ferns and epiphytic cactus as well as certain foliage plants, e.g., two *Coffea arabica* that my daughter Elise brought from Guatamala years ago as tiny seedlings. Baskets with plants hung from the rain gutter supports around the terrace. Decorating another wall, completely in shade with much humidity and little air circulation, hid my peperomia and pilea collection. At the sheltered front door entrance facing east, I kept my fibrous rooted begonias and two large aralias: *Dizygotheca elegantissima* and a 4 ft. x 3 ft. *Polyscias fruticosa,* my most beloved plant.

Until I found Mr. Boyle at McCollister's Moving and Storage, Inc. all the moving sales people I had talked with told me they did not move house plants. They suggested that I find a controlled atmosphere van and drive it myself or hire a driver. But Mr. Boyle told me



photo by Betsy Shuman

The author, (left) assisted by Wendy Stassen (with kerchief) readies some of the smaller plants for the van at the last minute.

United Van Lines (for whom they were an agent) had controlled atmosphere vans that were used to haul highly sensitive, costly computers. So we arranged for a van with two drivers to move my plant collection. One driver would sleep while the other drove, thereby keeping the plants in transit continuously.

house hunting in Chicago

Sam moved to Chicago on August 15. He househunted in the evenings. On weekends he brought me information about the more possible houses, which we would then discuss. Four times I flew out for the day to see the best of the houses Sam had screened. It soon became clear that we needed a greenhouse. Most housing around Chicago is jammed in, and the weather is severe. Unfortunately only one or two houses with greenhouses were available, and they did not suit us.

Suddenly in the middle of October our realtor called Sam to tell him about a house directly on Lake Michigan in Evanston just north of Northwestern University; the seller had just dropped the price. He went immediately and within a few days I flew out to go over it carefully. While there I phoned the North Shore representative of Lord and Burnham who came right over with the building contractor he used. We agreed a greenhouse was possible on the southwest side of the house. Late that afternoon we signed an offer to buy this house contingent on the Evanston planning board approving the greenhouse plans. In a few days our plan was approved and our purchase agreement accepted, so we had a house in the exact location we had sought for 10 weeks: lakefront property within walking distance of the University.

Next began a whole new relationship: dealing with Lord and Burnham and their local contractor. Almost immediately I drove to Irvington, New York in a snowstorm to order my first greenhouse. Someone in sales showed me the existing models built on their grounds. We talked about equipment and options. (No one mentioned energy saving devices.) I signed a purchase agreement and made a down payment. The greenhouse would be the Imperial model, 14 ft. wide and 21 ft. long with one end attached to the house and a Lord and Burnham door at the other end. The delivery date was scheduled for the middle of January. I emphasized the commission should go to Joe Friedler, the North Shore representative with whom I would be dealing.

I drove back through the snowstorm and numerous accidents to Haverford to plan the move. First I repotted almost all my plants into pots one size larger, occasionally using the same pot but adding fresh soil. That meant sterilizing lots of compost, having plenty of clay pots and soil additives on hand and crushing large amounts of crock. I knew the next year would be busy and there just would not be time available for repotting. This fall it took eight weeks to bring the plants indoors. Each plant was repotted, groomed and pruned; the soil was drenched with Cygon and the foliage sprayed with Benomyl.

I left the ivies outside to turn their beautiful fall colors and to freeze, but I moved them into sun. The scented geraniums and the large pots of zonal geraniums were tossed onto the compost pile. A few cuttings were to survive the move and root. The bonsai, kitchen herbs and hardy succulents also stayed outside. Three weeks before moving I stopped watering all my cacti and larger pots of succulents so they would be dry and firm during the move.

packing

On December 3, 1979 Wendy Stasen and Betsy Shuman arrived early at 141

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Grays Lane. We took flattened book cartons left in advance, folded them into boxes and taped each top and bottom with three strips of sealing tape. We then took a sharp linoleum knife and cut them around their girths, producing two halves. The three of us, all horticulture majors and graduates of Temple University, Ambler Campus, worked for six hours, packing plants into the open box halves using lots of moving paper to separate pots. For the fragile cascading sedums and hanging baskets we took several pieces of paper to make thick cradles. Some we propped on inverted empty pots. Then the two drivers, Al Gum and Greg Maher who came from Phoenix, Arizona, loaded the plants. Even Mr. Boyle was impressed with our packing skill and speed and he slowly let go of his concern for the plants. The tall, strong Southwesterners carried the packed cartons down two flights of steps from the attic sunroom, down the 150 ft. long driveway and up the ramp into the 45 ft. long van, which was too wide to bring up the driveway. The weather was fine—nippy after a frost, but it gradually warmed to the low 50s. We first loaded all the frozen plants, which gradually defrosted inside the 55° van. Then all the cactus and succulents from indoors, saving the most fragile foliage plants until last. These we covered with plastic for the trip down the driveway. The largest plants sat unboxed on the van floor. The drivers told us a full cup of coffee would ride all the way to Chicago without spilling. We then loaded necessary equipment for the plants, and because we were moving into an empty house, we included our double bed mattress, a bridge table and chairs, some cooking ware and said goodbye to the drivers.

The plant van arrived the next afternoon, and we unloaded. I had flown out that morning with five animals, had limousined to our empty new home and waited for the plants. Sam covered a bedroom floor over the garage with a muslin drop cloth. This was to be a plant room for the next 10½ weeks. The plants went on our picnic tables, benches, hanging basket racks, and a pingpong table, which had been transported in that van. For two hours the two cheerful, courteous men then unloaded the plants; first into 36° cold weather, then through the garage and up the back stairs. We left the ivies, woodies, bonsai, herbs, sempervivums, hardy sedums and two standard wisterias along the unheated garage walls on the floor. There they remained until March 27. During thaws I watered them but much of the time they were frozen. Upstairs I immediately set up four Wonderlites in ceramic clip sockets gripping the tops of Sam's photographic light stands. I put all the cacti under fluorescent lights on the floor under the pingpong table. It took me two weeks to get all the plants out of their cartons because the furniture van arrived the morning after the plants. My days were largely spent putting away the contents of some 350 cartons.



photo by Sam Felton

The author looks over plants in her bedroom before moving them into the greenhouse.

The drivers told us a full cup of coffee would ride all the way to Chicago without spilling.

Some of our antiques were damaged badly in the move, thereby diverting attention and time needed for the plants.

None of the plants were damaged in the move. The controlled atmosphere van indeed provided a velvet ride. The packers, professionals and amateurs, had been extraordinarily careful. But waiting around in a bedroom with hot air heat where the thermostat could not be set below 60° and with poor light, in spite of the Wonderlites, was horrible. If I watered, the succulents became etiolated. If I did not water, dead brown leaves developed. Despite a large fan, mealy bugs and some powdery mildew developed. The foliage and epiphytic plants did well in two bathrooms and another bedroom where I kept humidifiers going. But I lost my pride and joy: *Polyscias fruticosa*. It was too large for the bedrooms so I kept it in my library in front of a heater and a south-facing window. It died from poor light and most probably from lack of humidity and soil moisture.

the greenhouse

Now came the struggle to get the greenhouse built. December and the first three weeks of January were incredibly mild for Chicago—fine for digging the 40 in. foundation, removing a terrace, a horse chestnut tree and shrubs. By January 1, the foundation going under the greenhouse walls was dug and poured. The greenhouse arrived in cartons as scheduled. But I could not get the contractor to lay the cinderblocks on top of the cement. He would phone to tell me it was too rainy, too cold, too snowy, or too something else. Finally, I discovered that this was his beer-drinking season and furthermore he felt no urgency whatsoever to assemble the greenhouse, for he visualized me as a customer who built a

photos by Sam Felton



Before: Elise Felton checks a plan after the foundation for the new greenhouse has been poured.



After: The Feltons moved to the Chicago area in early December; the plants were moved into the newly constructed greenhouse on February 19.

greenhouse and then went out to a garden center to buy some plants to fill it. It was like dealing with a 10-year-old and I had to supervise his every move. (The one thing I would do differently if I were doing the move again, would be to get three bids from greenhouse builders and references from previous customers.)

At last, on February 19 I started to bring plants to the greenhouse. First ivy collection from the garage (I lost all the variegated ones because I gave them too much light too quickly), then the succulents, and lastly the cacti. The electrical work, the two gas burners, the hot water heater, sink and vents all worked perfectly. The carpenter converted a window in my library-workroom to a door. The 4 ft. wide redwood benches ran down the 21 ft. sides, with glass shelves above them. Stones, the size of golf balls, lined the floor. It was my horticultural dream completed.

It took me a week to move the plants in. Each needed grooming and some recycling. I threw away most echeveria, saving either a leaf or rosette for vegetative cuttings. They had suffered the most in the bedroom. Many succulents burned due to the change in light, even though this was the third week of February with few sunny days. The new greenhouse temperature was 50° nights and 55° days. Of all the plants my dipladenia won the prize for adaptability.

Crises were to come: one day I asked the electrician to put two new bulbs in the outlets directly over the peak of the greenhouse. From the extension ladder he reached to pull himself up onto the roof over my library-workroom suddenly dislodging what should have been stationary cement cornicing that ran along the border of the roof. One hundred pounds of cement block came crashing down grazing his shin, the ladder and destroying three large panes of greenhouse. I was barely out of harm's way and lucky to be alive. The next three hours were spent vacuuming glass and pieces of plant. We got Tom to come the next day to replace the glass and bent frame. Thank goodness for my 25-year-old tarp, which shielded the plants from the harsh elements overnight.

Next crisis: the heat went off one night when an underground electric cable snapped. Joe Friedler had told me the chances of this ever happening were one in a thousand, but it happened and the greenhouse went four hours without heat. Fortunately it was March 28 and the temperatures outside were in the low 40s. The last unfortunate incident was when Tom finally removed the horse chestnut stump with the power saw and it fell into the greenhouse, breaking a large pane.

Now at midsummer 1980 the greenhouse is functioning well. Tom did a good construction job—not a leak during torrential rains. The glass is painted with shading compound. I have still to fill the benches and cover the golf ball sized stones on the floor with small pebbles and must face the problem of better ventilation. The temperature goes up to 112° on sunny days. Shall I invest in a generator in case the electric cables snap again? Are the two gas heaters able to generate enough heat as promised at -25° outside? Shall I gradually change my collection to alpines which would cut down on winter's gas bills but increase summer's air conditioning bills? Will I ever adjust to the wind?

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Elise Felton is a graduate of the horticulture program at Temple University, Ambler Campus. She has shown her plants at the Philadelphia Flower Show and done three special exhibits at the Harvest Show: ivies, sedums, peperomias and pileas.

Sam Felton is an amateur photographer.

The Easy Bromeliads

by Adelaide C. Rackemann

Even an inept indoor gardener can grow bromeliads. I know, because I grow them. Even though my gardenias all die, my spiderplant is full of scale and my fittonia has withered away, I still have lots of beautiful bromeliads. They are definitely my kind of houseplant.

No plant is easier to grow, propagates more easily, or has fewer bothersome pests or diseases. No plant is more spectacular than a bromeliad in bloom. Even when it is not in bloom, the foliage of almost every kind of bromeliad is distinctive.

Bromeliads, or the Bromelia family *(Bromeliaceae),* include at least 2,000 identified species. Most are epiphytes, resting but not feeding on a host plant. Some are terrestrial, growing in soil. Others are saxicolous, clinging to rocks. Most are native to South and Central America, some are found by the coasts, some in rain forests, some in deserts; some high in the Andes are able to withstand frost. It is quite a thrill to look up at tall trees as you chug along by boat on the Amazon River to see bromeliads, especially the red foliage of some of the *Vriesea,* high overhead.

Some species such as Spanish moss *(Tillandsia usneoides),* discovered and identified by Linnaeus in 1762, are found in our own deep South. Except for one species of *Pitcairnia* found in West Africa, all bromeliads are native to the tropical and subtropical areas of the Americas.

Although the average bromeliad is a rosette of stiff leaves from whose center a brilliant inflorescence eventually appears, and although most bromeliads appear stemless, the characteristic that truly unites this family of plants is something else: all bromeliads have scales on their leaves, a characteristic that enables them to absorb both food and water.

Most of the cultivated species of bromeliad were formerly epiphytes, receiving their moisture and nourishment from the cup formed by the rosette of leaves. Roots of most bromeliads are not deep, serving only to secure the plant to its location, for example to the branch of a tree. Where there is soil, however, a bromeliad puts out a more elaborate root system and thus receives some sustenance from its roots as well as its leaves.

Of all the cultivated varieties especially suitable as houseplants, the most popular and best known is *Aechmea fasciata.* Certainly it is spectacular. Years ago I was given an aechmea, with its silver green leaves. It was my first bromeliad and I treated it gingerly, not sure what to expect. I filled the little cup with water, as I had been instructed, never allowing it to dry out, and waited and waited. The bloom was a long time in coming. One summer, several years after I had first received the plant, I put the aechmea outside, more or less forgetting it. One day, deep within the rosette, was what appeared to be a pink spider. Slowly the bright pink flower, dotted with purple, grew out of its vase of leaves. The secret of making it bloom, evidently, was to give it more light.

Besides the bromeliads I have been given or have bought, I have collected some from fallen trees in Costa Rica and Guatemala.

Since that first happy summer, I have had at least one *Aechmea fasciata* in bloom every year. As the inflorescence, which lasts several months, withers, new offshoots appear, each capable of producing a new flower. The old rosette eventually dies without producing another bloom.

Since this first experience, I have branched out with bromeliads. *Billbergia,* the first kind of bromeliad to be introduced for cultivation in the United States, is another easy plant to grow. With fewer leaves than the aechmea, it is tall and tubular, its foliage usually marked with gray crossbands, its inflorescence—red, pink, blue, depending on the variety—drooping from its vase. I have several that bloom during the winter. This species, like *Aechmea* and others, has been hybridized widely.

Equally easy to grow is *Ananas.* This is the pineapple, and some people, though not I, are successful in growing the cut-off top of the pineapple fruit. I have better luck with an already potted *Ananas comosus* 'Variegatus,' which I was given and which has thrived. With its long sharp bright green leaves bordered with white, this plant is arresting for its foliage, even though it has yet to produce a pineapple.

Perhaps the most satisfactory of all my bromeliads is *Cryptanthus,* a tiny, low growing species. Its name is derived from "crypt," meaning hidden, and "anthos," the Greek word for flower. *Cryptanthus* plants are terrestial and are sometimes called "earth stars," owing to their shape and the unusual patterns of their leaves. They come in rather subdued shades: gray, brown, white, dusty pink, sometimes in combination. They spread rapidly, sending out stolons, and require even less care than most bromeliads. Sprayed with water occasionally, they thrive in my cool greenhouse. I often give away new plants of *Cryptanthus* to delighted friends. The flowers are white and inconspicuous, so the plant is really grown for its small, star-shaped, variegated foliage. Because of its size and compactness, *Cryptanthus* lends itself nicely to use in a terrarium.

My favorite bromeliad is one I prize for its foliage, even though its inflorescence is equally interesting. *Neoregelia carolinae* tricolor is an arresting shiny leaved bromeliad, of white and green stripes and solid red at the base. The inflorescence, appearing in late summer, is purple but stays submerged within the vase of brilliantly colored leaves. Still another prized one is *Guzmania lingulata cardinalis.* Guzmania is a species from the Andes. It has smooth edged, glossy, soft leaves. Its flower spikes are polystichous, radiating from all sides, and the bracts of my particular variety are brilliant orange. (See



photos by Francis Rackemann

Guzmania



Cryptanthus 'Moon River' growing in perlite on greenhouse bench

picture.) Other varieties are red and yellow. Mine blooms in midsummer, requires only occasional watering, and does well in semi-shade.

Besides the bromeliads I have been given or have bought, there are some I have collected, picking them off fallen trees in Costa Rica and Guatemala. Having obtained a license from the United States Department of Agriculture to bring bromeliads into the country, I have always washed and dried these specimens thoroughly, to pass under the eagle eyes of inspectors and Customs officials. Most of the bromeliads I have brought into the country are *Tillandsia,* by far the largest group, consisting of at least 400 species. Most have done well for me, some blooming, some not. Interestingly, the bromeliads that have red foliage, such as some of the *Vriesea,* lose their red color when they are brought back here, since the light they receive is simply not comparable to that in their native habitat.

Caring for them is, as I say, easy. As long as the little "cup" has water, the rosette of leaves will survive. Occasional misting seems to help keep the leaves looking healthy. A temperature of 50°F, our greenhouse temperature, agrees with the plants, while the light they receive now, through a bubbly-plastic insulation glued to the inside of the greenhouse, seems adequate for all but a few species. The majority of my plants grow in a soil mixture of perlite and standard potting soil, but fir bark or osmunda (the roots of the osmunda fern) can be used, and has the advantage of providing excellent drainage. It also helps fasten the small roots of a young "pup" that one is transplanting; sometimes the "pup" will fall over when newly planted in the perlite potting soil mixture, simply because it hasn't sufficient roots. Transplanting established bromeliads is seldom necessary.

Only when the old plant has bloomed and has put out new offshoots at its base does the pot become too crowded. At this point, I cut off the old rosette, using a sharp knife, and toss it on the

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Cutting off the old rosette and a new one to be repotted. The old one, which has already bloomed, is tossed on the compost heap.



compost, since it will never bloom again. This means the new plant or plants, if there has been more than one offshoot or "pup," stays in the old pot. But if two pups seem too many for the pot, I cut off one pup and place it in a new pot. (See photo.) I water it well, filling the cup but also thoroughly wetting the soil, osmunda or fir bark. I never water any of my bromeliads oftener than once a week, whether newly planted or well established, and use a liquid fertilizer about once a month at the most. The water I use for my plants is always room temperature, since I keep it in plastic milk bottles in the greenhouse.

I find that having so many different, unusual bromeliads to display is a bit like making an exceedingly easy dessert, so delicious and enjoyable your guests assume you spent much effort for the pleasure given. When people see these striking plants, they think you have a green thumb. So when all is said and done, bromeliads are most satisfactory.

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A young achmea is placed in a mixture of perlite and potting soil. Notice the root system, well developed even though bromeliads are epiphytic.

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photos by Lester Levine

Woodland trails seem longer because of turns and twists. Overhanging branches add to the wilderness atmosphere.

The Amazing Non-Garden Garden



Rock path in moss and fern garden. Christmas fern *(Polystichum acrostichoides)* was collected from a nearby building site. Mosses were planted from spores and divisions.

by J. S. L. Greentree

As a city child I spent summers at a little farm and at a girl's camp in the Adirondacks. Counselors were resigned to my regular disappearances when I wandered away from the tennis court to spend quiet afternoons sitting alone by the lake or in the forest, watching how nature fit together. In my work as a landscape architect I have found that childhood memories greatly influence what satisfies each of us in our private gardens.

In 1961 I bought a house in a woods in the suburbs of northern New Jersey. There was no garden or landscaping by anyone's standards. Previous owners had planted the usual line of assorted evergreens straight across the front of the house. Another line of hemlocks at the crest of a hill effectively blocked the view from the bay window. Lawns had been seeded over the septic field

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Board bridges dripping spring.

and in front of the house. That was about it.

My fantasy was that this place was far from civilization, and that I could recapture the happiness and freedom of childhood summers. In reality my two and a half acres was in a traditional neighborhood of neat gardens with buzzing power mowers cutting endless lawns on Sunday afternoons. As the old habit of quiet observation returned it became apparent that nature, along with superb rock work by some ancient glacier, had created a woods growing in the rich clay soil of a sloping hillside and a tiny brook that trickled past boulders in a rocky ravine. Birds and other animals, wind and rain had planted and nourished the land in the 50 years since it had been farmed.

The typical tulip/beech forest of this region had reached heights of about 80 ft. While oak *(Quercus alba)* high on the slope, sweet birch *(Betula nigra)* and yellow birch *(B. alleghaniensis)* near the brook, a sour gum *(Nyssa sylvatica)*, a pignut hickory *(Carya glabra)*, and red maples *(Acer rubrum)* here and there were some of the hundreds of tall trees. The understory trees were white flowering dogwoods *(Cornus florida)* in such profusion that May evenings were like star shows at the Hayden Planetarium. The understory shrubs were mostly various viburnums and spicebush *(Lindera benzoin)*. It was the spicebushes that made me begin to dream of oriental stroll gardens. Their branches grow in gracefully angled and layered shapes. Their tiny yellow flowers promise spring in March and the smallest bit of a crushed leaf perfumes one's fingers. There were masses of ferns and myriads of wildflowers everywhere.

The point is that the garden was already there. As I pulled and composted brambles and poison ivy the concept of this place began to take shape. This was not to be a Japanese stroll garden with neat paths passing miniature scenes of shrubs clipped in stiff cloud patterns. This was a beautiful wild wood—a place to be in, to feel at peace, to walk through quietly, to sit and listen to the birds.

The first job was to have a shallow pond dug in a soggy place where all the trees were tipped over, indicating underground springs. A low earth dam was built of the clay dredgings and covered with streambed rocks. A pipe was cemented beneath the dam to allow annual cleanout of silt. Over the years the silting and erosion have increased tremendously as upstream lots have been stripped of their forest cover. The pond holds enough water to reflect the moon and trees. A pair of Mallards comes by for a month or so each spring. The resident crayfish has somehow avoided being eaten by the raccoon family nesting high in a hollow tree.

Spicebush branches grow in gracefully angled and layered shapes. Their tiny yellow flowers promise spring in March and the smallest bit of a crushed leaf perfumes one's fingers.

Laying out a winding path system was the next step. The idea was to fortify the feeling that this was the wild wood with adventure just around the bend. Several hundred feet of narrow earth paths were cleared. These are kept smooth with the back of a steel rake and sometimes edged with fallen tree limbs. Large rocks were buried to their tops as secure footing down into the ravine. In other places small stones were hand set, with moss smoothing the spaces. A branch path was used to span a damp spot. All material for the paths was found on the site and no trees were cut to accommodate the design. It was quite the opposite. Shrubs and trees determined the design. Wildflowers and ferns that were in the way were transplanted.

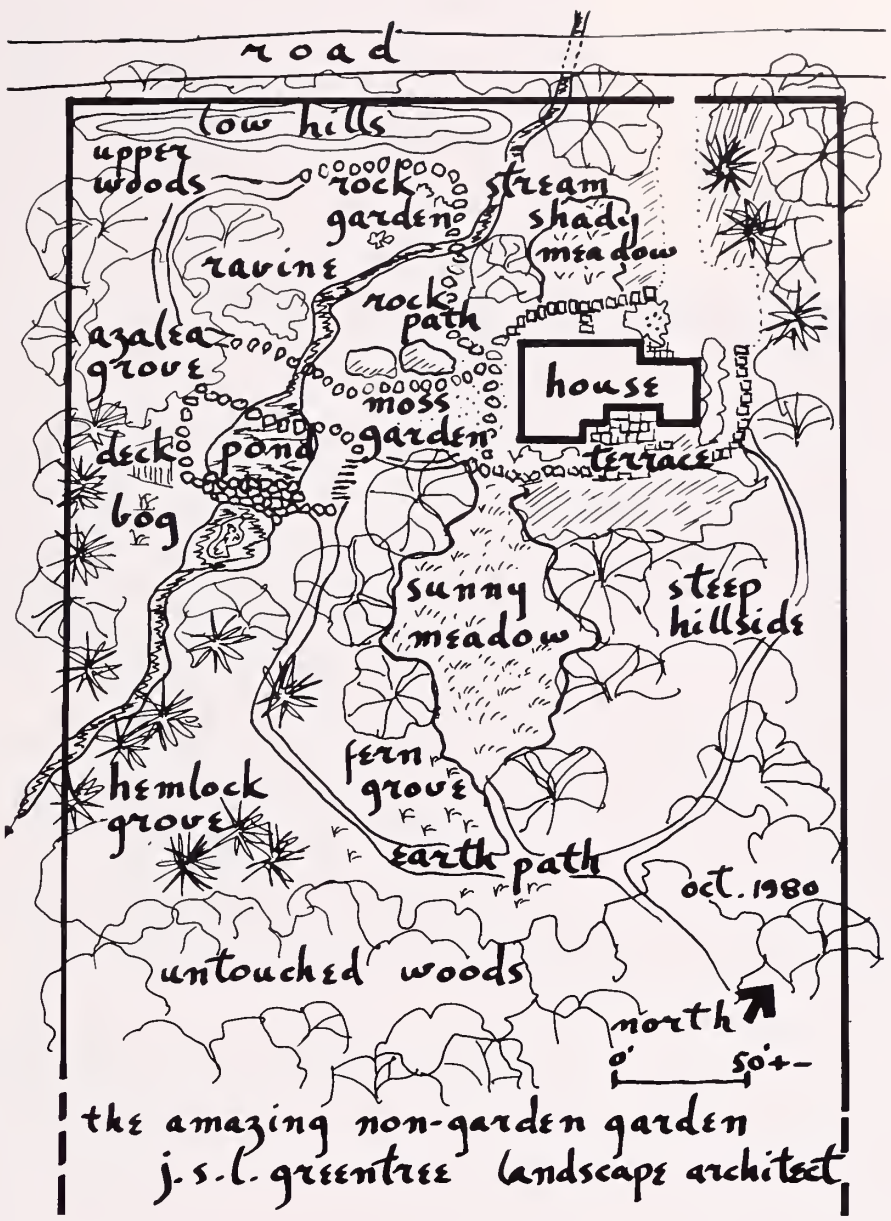
Biodegradable garden and household waste was piled in a long low hill next to the roadside. This king-sized compost pile now encloses the garden. It supports a thriving mass of rhododendrons *(Rhododendron maximum* and *R. roseum* 'Elegansi'), mountain laurel *(Kalmia latifolia)*, yews and highbush

blueberry *(Vaccinium corymbosum).* A carpet of pachysandra dotted with collected daylilies *(Hemerocallis fulva)* keeps down weeds along the road. *Vinca minor,* ivies and varieties of spreading euonymus were planted on the slopes of the ravine to catch and hold debris brought downstream in storm runoff. These fast spreading groundcovers are fine for a large scale garden but tend to overrun delicate wildflowers. As the garden matured I made a deal with clients and friends to come help clear the paths of encroaching groundcovers, which they could transplant for their own projects.

Other features of this garden were built over many years. The lawns were left uncut to grow into wild meadows of ever-changing species of goldenrods, tall grasses, buttercups and other herbaceous plants. Flocks of migratory birds have the place staked out as a sure thing on their way here and there. Tree saplings are hand pulled to keep the meadows from growing into woodlands.

The rear half acre has been left untouched as an exhibit of local ecology. An extensive collection of rare and native woody plants, mosses, ferns and dwarf shrubs has been incorporated throughout the site that my son so aptly named "The Amazing Non-Garden Garden where you never know what was there and what was put there."

It's been 19 years since the garden was begun. This is as much a history as an explanation, which brings me neatly to a major point. All gardens grow and change. Now that's a simple statement that I find is not well understood. Changing shade patterns as trees grow and die govern what will grow nearby. Young saplings will take the place of the old or unhealthy trees that succumb to insect attack and other damage. Insect invasion and predator build-up balance in a seesaw pattern. Periods of drought and too much rain influence what survives and what does not. The Amazing Non-Garden Garden has grown with these principles as a guide. No chemical sprays, pesticides, fungicides or weed killers have been used to try to stop nature's work. No plants have been watered once they have become established. Careful attention to planting soils, mulches, sun and wind patterns have made this garden bloom.



I have moved to Colorado to begin a new life and a new garden, shared this time with deer that wander down from the foothills to camp out behind my bathroom window. The Amazing Non-Garden has new owners with wonderful sensitivity to this special wild place. It continues to grow as an example of a new way to live with the land.

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Some Writings about The Amazing Non-Garden Garden

House & Garden, October 1974
p. 50. "A Great American Idea: 'The Amazing Non-Garden Garden'" by Beverly Russell.
p. 120. The very personal garden of Joan Greentree. A back-to-nature garden.

Landscape Architecture, July 1975
p. 268. "People" - Joan Greentree
p. 286. "The Amazing Non-Garden Garden" by Joan Greentree.

New Jersey Monthly, April 1977
p. 31. "The Lay of the Land" by Sue Ann Jones.

Landscapes for Living, ed. by Grady Clay of *Landscape Architecture* magazine. New York: McGraw-Hill, 1980.
p. 91. "The Amazing Non-Garden Garden" by J. S. L. Greentree



Carton packed for shipment by U.P.S.: (bottom layer—not seen) chives, tarragon and thyme; (top layer) sweet basil, purple basil, spearmint, black peppermint, chervil, nasturtiums

photos by Edmund B. Gilchrist, Jr.



Getting More Mileage from Herbs

by Julianne R. Street

Herb jellies — sweet basil on left, purple basil on right with sprigs of the herbs beside each jar.



Basket of small scented pillows stuffed with fragrant herbs



Top – to right of basket handle: garlic chive blossoms, lemon verbena, grey sage, rosemary, lavender blossoms, common chive blossoms, sweet marjoram, mints, lemon balm, purple basil

What plants are as exciting to all the senses as herbs—especially the culinary variety? They smell delightful, taste delicious, feel good to the touch, are pleasing to the eye.

In summer, fresh culinary herbs work magic in our foods and provide beauty and fragrance in our homes with herb arrangements. In winter, the frozen or dried ones add interest and zip to cold weather menus and others are pretty and useful as decorations—especially at Christmas time. Throughout the year they add unique flavor to breads, cookies, butter, vinegar, nuts and jellies. While the culinary herbs are pleasing our palates, others are providing fragrance to many of the products we use in our daily lives—sachets, soaps, powders and lotions. The use of herbs in drugs is, of course, well known.

Herbs are the oldest cultivated garden species on record, have their origins in all parts of the world and have traveled with man in useful capacities in his migrations around the globe, whether he was colonizing or fighting wars. According to herb lore, of which there seems to be an endless amount, they were used in ancient times to chase witches and monsters, cast spells, ease childbirth, prevent the hair from falling out, heal wounds and the bites of mad dogs, cure the sick, prevent hangovers, act as aphrodisiacs and do anything else needed to nourish or cure body and soul. Special qualities were attributed to each herb and sage had the most miraculous qualities of all. It was considered a remedy for almost everything—including kidney disorders, ulcers, rheumatism, coughs, colds, snake bite, grief, forgetfulness, graying hair and the advance of old age. Even today it is said that a man should always carry a piece in his pocket for health and prosperity. Balm was used in ancient times to soothe the nerves, relieve tensions and cheer the disposition. It was also supposed to contribute to longevity and indeed it must because the Prince of Glamorgan, who drank two cups of balm tea every day, lived to be 108! Fennel was considered to have incredible properties. In addition to stuffing keyholes with it to keep bad spirits out, it was used as a tea for babies to cure colic. Boiling the roots in wine and applying them to the eyes was believed to cure cataracts—and female deer were supposed to have

Sweet marjoram is the one herb that seems to have more fragrance dried than fresh and is such a pretty, dainty herb that it is especially well adapted for use in the small baskets.

continued



Basket arrangement of fragrant herbs: applemint, black peppermint, pineapple mint, silvermint, lavender, lemon balm, lemon eucalyptus, lemon verbena, lemon geranium, rose geranium, blue salvia, sweet woodruff

purged themselves with it before giving birth. Today it is used fresh for flavoring fish and dried as the fuel for grilling fish—both delicious.

Today tremendous quantities of culinary herbs are grown throughout the world and many of them are used

The Prince of Glamorgan drank two cups of balm tea every day and lived to be 108!

commercially, fresh or dried, as leaves or seeds to flavor the processed foods we buy—condiments, meat and bakery products. The fresh ones are much in demand for cooking because they do such wonderful things to ordinary foods and no one who has cooked with herbs ever wants to cook without them. The emphasis on low salt in our diets today has also increased their use in cooking as they are an excellent substitute for salt in making foods palatable. The interest in them seems to be spreading as evidenced by the large number of people who are eager to learn how to grow and use them. When a New York taxi driver asked me if he should eat the "curly green stuff" served on his steak in restaurants, I realized the enormity of the challenge to bring herbs to everyone.

Even experienced chefs, however, are not always familiar with some of the less well known herbs such as chervil, salad burnet and nasturtiums so we try to provide the inspiration for their use by describing the beautiful and mouth watering results that can be achieved. Chervil is very difficult to raise in this country and is not ordinarily available, so its unusual taste and ability to bring out the flavor of the other herbs is not understood by everyone. Salad burnet has the delicate flavor of cucumber and is a great herb to snip over a salad when there is no cucumber. Also, it adds a unique flavor to mesclum (a salad originated in Provence, made from baby lettuce, arugula or roquette and chervil). Nasturtium leaves and blossoms mixed with other tender greens for a salad are a delight for the eye and the palate. The blossom with its tiny drop of honey is a special treat.

basket arrangements for tables

The demand for herbs meanwhile, both fresh and dried, and for herb products continues to grow. Here at Apple Pie Farm we are somewhat like the farmer who boasted that he used every part of the pig except the squeal, as we use almost every part of our herb plants for something either delicious, decorative or useful. The best and freshest of our harvest go to our customers for the chefs to enjoy using and for the public to enjoy eating. Some of the prettiest and most fragrant go into basket arrangements for buffet or dining tables in homes or elegant restaurants or for customers to send to friends—sick or well. One of our most interesting orders for a basket arrangement came last year from a famous dress designer and hostess in New York for a dinner party in her Park Avenue apartment. She had seen one of ours in a New York restaurant, said she was enchanted with it and telephoned her order personally. We prepared a basket suitable for her round table. The basket contained more than 20 different culinary herbs including Italian, sweet and purple basil, salad burnet, lemon balm, chives and pretty purple chive blossoms, applemint, orangemint, spearmint, black peppermint and pineapple mint, sweet marjoram, oregano blossoms, parsley, rosemary, grey and purple sage, winter savory, sorrel, tarragon and thyme. Some of the mints were also in bloom and added color as well as fragrance. Along with the order we sent a tiny basket of scented herbs and a container of wild flowers that were in bloom.



Herbs drying in shed: goldenrod (in background), wild artemesia (lower line), wooly lamb's ears (upper line on right)



Strawberry jar planted with herbs: parsley, chives, rosemary, sweet marjoram, oregano, thyme

This year, another challenging order for basket arrangements came from The Four Seasons in New York for a special dinner—43 tiny baskets of culinary herbs. One for each guest to see, touch, sniff and take home. For these we used mostly the herbs with small leaves such as sweet marjoram, rosemary, winter savory, Italian basil, French, lemon and oregano thyme, mints and tarragon—accented with purple basil, tricolor sage, and white blossoms of garlic chives.

In restaurants the large baskets are placed on salad bars or buffet tables

and sometimes passed around to diners with scissors to snip as they please. The small baskets are ideal for hospital gifts as the fragrance of herbs overcomes the less fragrant odors that are sometimes a necessary part of hospital routine. In winter time, we fill the small baskets with an assortment of dried herbs for use as favors or gifts. Although they lack the intense color and fragrance of the fresh, they still retain their own particular fragrance and the contrast in shapes, colors and textures is interesting. Sweet marjoram is the one herb that seems to have more fragrance dried than fresh and is such a pretty, dainty herb that it is especially well adapted for use in the small baskets.

flavoring vinegars

Some herbs, such as sweet and purple basil, dill and tarragon, are especially suitable for flavoring vinegars, so they go into our vinegar infusions. We use three different vinegars—apple cider vinegar, white wine and red wine vinegars. Certain combinations seem to "marry well." For example, sweet basil with apple cider, purple basil with red wine, dill with white wine and tarragon with both red and white. After the infusions are made, each batch is taste tested to achieve the desired flavor and uniformity. The vinegar is then filtered into its respective bottle and large sprigs of the flavoring herbs are added to each bottle which makes them most appealing to the eye and irresistibly attractive to the buyer. We use bottles of different sizes and shapes—some utilitarian and some handsome enough for gifts. In the latter group, one of our most popular is a large rectangular corked bottle with twelve different herbs in it—a sort of "vinegar scape"—with sprigs of rosemary, thyme, tarragon contrasting with feathery pieces of chervil, dill and parsley, rosettes of basil, tiny bunches of chives knotted in the middle, the reddish stems of mint and the lovely colors of tricolor sage. Each adds its individuality and flavor. Several years ago, friends took a bottle of this to Amsterdam, Holland, for their kitchen windowsill and, at last report, it was still there as a favorite decoration. As for taste, the intense flavor of the herbs seems to completely transform the original vinegars into smooth, delicious and mellow concoctions. To quote a customer, who is an important influence in the world of food, after using the well-known technique of taste-testing by using his finger in the bottles, "They are exquisite."

dried herbs

The dried herbs fall into three categories—bunches, on the branch, and leaves. The bunches are hung upside down and dried in the attic of our farmhouse. Sometimes, when the weather is suitable, they are put on lines out of doors to start the drying process before hanging them in the attic. These dried bunches are used for both culinary and decorative purposes. Fennel stalks and rosemary are good examples of the former and marjoram, mints, sage, savory and thyme of the latter. The branches and leaves are dried on trays and subsequently bagged or put in jars for use as sachets or in cooking. The trend is to preserve as many culinary herbs on the branch as possible and not to crumble into powder as is often done. The fragrant ones, such as lavender, mints and the scented geraniums, are especially useful in making small pillows, sachets for just strewing in dresser drawers and linen closets. (These herbs must be prepared with a fixative to be sure they will retain their fragrance.) A small pillow stuffed with fragrant herbs placed under the regular pillow is delightful for those last waking moments at night or for greeting one when the alarm rings. A friend, who also grows herbs, recommends strewing crushed lemon verbena or sweet woodruff leaves between mattress pad and mattress for the perfect night's sleep.

Here at Apple Pie Farm we are somewhat like the farmer who boasted that he used every part of the pig except the squeal, as we use almost every part of our herb plants for something either delicious, decorative or useful.

After we have used all of the choice herbs there are still those fragrant small bits and pieces too good for the compost pile, so they are packed into plastic bags and sold for strewing and fireplace herbs. Only then does the compost pile get its share—the imperfect leaves, stalks and trimmings—and they will come back to us next year by contributing to more and lusher growth on a new crop to start another cycle of pleasing our senses. So, in addition to being fun for gardeners, herbs really are for fragrance, flavor, decorating, healing, soothing and pleasure for the eye.

As for appealing to the senses, I can think of no better way to end this brief account than to describe Baron Roy Andries de Groot's reaction when he receives his delivery of fresh herbs and herb vinegars from Apple Pie Farm. First, he is as excited about them as a child with a new toy; he handles, feels and smells each bunch or bag or bottle. He then asks that it be described to him by his wife Katherine. While feeling and smelling the herbs, he is making plans for using them in experimental cooking and for writing about them in his syndicated newspaper column. Then he speaks of visiting Apple Pie Farm with his wife and his seeing eye dog, Athenee, of walking between the rows of fragrant herbs and having sorrel soup and apple pie on our kitchen terrace. He is blind but his pleasure is dynamic enough to allow others to see better.

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Judy Street owns and operates Apple Pie Farm, which is located between Malvern and Phoenixville in Chester County. She has approximately five to six acres under cultivation in culinary herbs and sells them and herb related products to restaurants and gourmet shops throughout the United States.

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Stanhopea tigrina

Orchid Addiction

by M. M. Brubaker

You are told you can grow beautiful corsage orchids (cattleya hybrids and cymbidiums) on your windowsill as easily as begonias. That could be the beginning of a long enslavement. These types are not well adapted to the low lights in homes. I think it is fair to say that the majority of people who acquire those corsage orchid plants fail. Some soon learn the advantage of a greenhouse and provide one. Another few persist, study the special requirements of orchids, usually with the help of experienced growers, and do a fine job of blooming orchids on the windowsill.



Angraecum infundibulare

photos by M. M. Brubaker



Disa uniflora

For the windowsill beginner I would recommend paphiopedilum (slipper orchids) or phalenopsis (moth orchids).*

Orchids have an artificial glamour. When the grower tells a visitor that a certain inconspicuous flower is an orchid, the interest is usually greater than warranted. A large and romantic literature, both historical and fictional, has been built up around orchids. The search for orchids in the jungles has been the subject of many books and articles, which have helped to glamorize them. Fictional tales that exaggerate qualities keep coming up. Somebody is always asking about a black orchid.

The most enduring interest in orchid growing is based on technical attractions such as the almost infinite variation in the flower geometry, the ingenious contrivances for pollination, the opportunities for new and grotesque hybrid combinations, the challenge of solving growing problems for recalcitrant species, or the adventure of exploring in foreign lands for new species. Orchids also have a great deal of intrinsic beauty in colors and color combinations.

The long lasting quality of the flowers is proverbial, although many orchids do not come up to expectations in this respect. Durability of the cut flower varies from many weeks for some lady slipper types to a few hours in other species. For example, the beautiful miltonias, or pansy orchids, may last well on the plant, but wilt soon after cutting. The large and showy stanhopeas last only two or three days, but are grown by a few enthusiasts who like their scent and the excitement of seeing them pop open. Modern cymbidium hybrids have the feel of plastic, and not only last for weeks as cut flowers, but will take considerable flailing at a teenage dance.

Visitors to my greenhouse are often surprised to learn that many orchids have intense fragrance. I think some of nature's most beautiful fragrances are put out by orchids. Variations on the vanilla theme fascinate me. The wonderful scent of *Epidendrum radiatum* has been described as a combination of beeswax and vanilla. The peculiar, sweet fragrance of the stanhopeas seems to stay in my nose after I have left them. I don't know whether a bit of the quiddity has settled there or whether it is a lasting mental impression. Incidentally, I have found that stanhopeas are ideal flowers to "show" the blind. They are large, attractive to handle, have a lip with a strange bony feel, and they throw out quantities of that haunting fragrance that a blind person isn't likely to forget.

Orchids have an amazing ability to turn on and off their fragrance. If you don't notice a fragrance, it is possible that it is the wrong time of day or night. They seem to be conserving this valuable attractant for the time when it is really needed. Some are most fragrant early in the morning when the sun first shines on them. The small brassavolas are fragrant only at night. They turn on their odor mechanism after dark and the greenhouse reeks with the sweetish aroma. In the daytime I am unable to detect this odor on the flower. Brassavolas are particularly nice in gift boxes because they build up a perfume that bursts out when the box is opened.

People often remark about the disparity between an orchid's beautiful flowers and its unattractive foliage. On the other hand, some orchids are cultivated for their beautiful foliage. The Japanese take great pride in their miniature cymbidiums and neofinetias with variegated leaves. Americans are often surprised when they go to a Japanese orchid show and see competition only in cultural perfection without flowers. Jewel orchids are grown in India as a foliage plant because of the striking leaf color pattern. Some jewel orchids have veining of velvety maroon combined with irridescent green. They are, however, difficult to grow in northern greenhouses because they require both a high temperature and a high humidity. As foliage plants I prefer mottle leaved paphiopedilums, which have very attractive foliage and are considered by many to be easy to grow on the home windowsill.

easy culture and endurance

Believe it or not, a virtue of some orchids is their ease of culture and endurance. It is suprising to see the conditions they withstand in nature—conditions that would put a cactus to shame. Laelias can be found hanging on a dead tree in the open in tropical sun, and without water for long periods. At another season they may be deluged with rain. I once answered an advertisement from India that offered 25 blooming sized orchids for $10 postpaid. After they received my money, it took two years and considerable help from the Department of Commerce to wrench the plants out of India. When they came, they were in a broken, lattice work box woven of bamboo strips. I'm sure they had no water during a long trip in the hot hold of a slow boat. Twenty-four of them lived and flowered.

Successful culture of a collection containing a wide variety of orchids, requires rather close daily attention. On the other hand, if the grower restricts interest to a few types, it is possible to have showy flowers interspersed with rather long periods of neglect. With automatic greenhouse vents and heating, selected dendrobiums, pleiones, or oncidiums could be completely ignored during a month or more on vacation.

easy hybridizing

The hybridizing versatility of orchids is unique among flowering plants. It is possible, in fact easy, to make crosses between two orchids that are seemingly unrelated, and which differ radically in flower size and form, in vegetative characteristics, or in cultural require-

continued

*See "Growing Orchids as House Plants," L. Wilbur Zimmerman, *Green Scene,* November, 1976.



photo by Jean Byrne

The author in one of his greenhouses

ments. Intensive hybridization over the past half century has led to the combining of desirable characteristics in a surprising fashion. In effect a whole array of new genera has been created.

It is interesting to examine the reason for this hybridizing versatility. With most flowering plants, it is possible to cross only very closely related species, and this rarely happens in nature even when the two species are growing together. The integrity of most species is protected by an internal mechanism, which prevents cross pollination and which may be very difficult for the hybridizer to overcome. On the other hand, orchids have protected the integrity of the species by use of an external mechanical arrangement that usually fits only one pollinating insect species. That mechanism makes it easy for humans to overcome. All that is necessary is to insert a toothpick just where the pollen is plastered onto the insect's back and then insert it onto another flower's sticky stigma, which pulls the pollen off the insect.

The relation between the orchid and the insect is illustrated by the often told story of Darwin and the Madagascar orchid. Darwin made predictions concerning the characteristics of the particular pollinating insect for *Angraecum sesquipedale* by examining the geometry of the flower. The species name, sesquipedale, refers to the long spur with nectar at the bottom. A moth with a long tongue was predicted as the pollinator. After Darwin died, the insect was discovered and fulfilled his predictions.

Orchid seed has fascinated growers and has been the subject of considerable research. Until the early part of this century, practically all orchids grown in greenhouses were collected plants started from seed by nature. Since starting plants from seed was so difficult and uncertain, hybridizing was greatly retarded. The seed pod of an orchid contains myriad microscopic seed. These differ from the seed of most all other flowering plants. The embryo is undifferentiated. There is no radical or cotyledon. Furthermore there is no endosperm, or reserve food supply, for the tiny seedling when it is first starting. In nature orchid seeds must germinate in the presence of fungi with external enzymes, which hydrolize cellulose to form sugar. This sugar from around the fungi supplies energy to the immature seedling and takes the place of starch in the endosperm of ordinary seeds. The odds against such association with fungi, and other restricted conditions for germination, make it clear why the orchid puts out a million seeds and why growers had so much trouble obtaining new plants from seed.

Early in this century there was considerable interest in commercial culture of vanilla orchids for their seed pods, which are the source of vanilla extract. In the 1920's, Professor L. Knudson of Cornell University undertook to solve the problem of starting quantities of vanilla orchid plants from seed. He reasoned that all the orchid seeds needed was a substitute for the endosperm, or a supply of sugar. He developed a method of sprouting the orchid seeds on sterile nutrient agar containing sugar, the way bacteria are cultured in the laboratory. That was the beginning of a new industry, raising orchid seedlings for the growers, and started an explosion in hybridization.

Discussion of hybridization leads directly to the matter of the orchid's sex life. As I have already mentioned, orchid flowers are usually uniquely designed to attract and use a particular insect. There are all manner of insect traps in the flowers. The catasetums have a trigger mechanism that slaps onto the insect's back a sticky pad carrying pollen. This action is so vigorous in some flowers that it scares people who put their finger into the flower to trip the mechanism. The force can be great enough to shoot pollen across the room. The coryanthes has a pool of enticing liquid into which the insect inevitably slips. The sides are armored to prevent escape except up a ramp where the pollen is glued onto him. In addition, most orchids have odors that attract a particular insect, but the worst examples of fraud are those that duplicate the sex attraction odor of the insect female. Still worse are such orchids as the ophrys and trichocereus which have, in addition to the odor, a visual replica of the pollinating insect female and her shape and feel. The imitation must be good because it works and the plants continue to be pollinated by those ardent and gullible males.

All this conniving to subjugate insects leads to bizarre flower forms. The big stanhopeas have a cage of bony projections strong enough to control a bat, while the tiny stellias must use the tiniest of insects. The phalaenopsis imitates a big white tropical moth. No doubt, one of the major attractions of orchids is their varied form, from the so-called Punch and Judy orchids to the big, showy coryanthes with its insect swimming pool and two faucets that drip enticing liquid.

As you can see orchids have many legitimate attractions; now perhaps you can spare some sympathy for those poor human addicts who are taken in by them.

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M. M. Brubaker keeps his orchids, along with other plants, in his three greenhouses in Chadds Ford.

photo by L. Hess

Must You Sit on the Sinningia: Toads in My Terrarium

by Mary Lou Wolfe



Toad in a terrarium cave

Reprinted from *Small Habitats* by Lilo Hess, Charles Scribners & Sons, 1976

My year does not begin in January. My personal New Year arrives when I hear the first spring peepers, usually after a warm rain late in March. If I haven't heard frog songs by the end of March, I drive to one of my favorite soggy places: Andrew Wyeth country along the Brandywine, Crum Creek below Swarthmore or the canal at New Hope. These can be counted on for the froggy chorus that starts my year.

Somewhere along the evolutionary scale, I think my family was slow getting out of the swamp. Turtles, frogs, salamanders and toads have fascinated my older brother and me for as long as I can remember. Most older brothers discover ways to torment younger sisters and my sixtyish brother found a new way to do it just last September when he phoned from his home in Georgia.

"Guess what, Moo," he gloated. "I just found a newly hatched box turtle in that sandy area toward my woods. Bright little yellow shell, lovely brown markings, whole thing no bigger than a quarter. Of course, I let it go."

Envy, envy; long distance one-upsmanship. He knows I have been looking for a land turtle to live in my greenhouse. John let it go but Roger Conant, former Curator of Reptiles at the Philadelphia Zoo says "Box turtles are kept more frequently than any other turtles. Most adapt themselves readily to captivity, requiring only a back yard or a box of dirt for digging and a shallow pan of water for an occasional soaking. They are omnivorous and are fond of fruits, berries, and raw hamburger. Ages of 30 and 40 years are common, and a very few may reach the century mark." That little turtle could have feasted on slugs and strawberries under the streptocarpus, and I would have provided for it in my will.

Perhaps my brother has evolved a bit farther than I for I find it very hard to get through winter without some sort of swampy creature to watch as I wait for spring. Finding no box turtles in my back yard, I usually capture some sort of amphibian to winter in my terrarium. For a few years, I felt guilty about these kidnaps until I realized that no toad, newt, or salamander has perished under my glass. Several, in fact, have doubled in size between fall and spring when I return them close to where I've found them. I feel it's unfair to keep them for more than nine months because it would alter their life cycle too radically.

A red eft (land form of the red-spotted newt) was my first winter ten-

continued



photo by Mary Lou Wolfe

A red eft salamander has just feasted on aphids on a nasturtium leaf plucked from the garden as a treat.

ant. It thrived in a warmish terrarium amongst *Episcia, Acorus gramineus* 'Variegatus,' and sinningia. It's pictured here in a plastic terrarium with the dome removed for picture taking. The newt's idea of a great meal was a nasturtium leaf covered with aphids. Newt attacked it aphid by aphid and the feast took hours. This bright red creature grew so much that he shed his skin several times pulling it over his head as if removing a sweater.

The first year I decided to house a toad through the winter, I felt unsure that I could keep it alive. Toads eat live, moving foods like small worms, spiders and moths. The motion of the prey serves as a triggering mechanism for springing into action. Where would all this action come from? I didn't want to have a shrinking toad sulking in my living room. My trial toad started in the red eft's quarters as that was what was available when I caught him. I knew that habitat would be cramped, so in a large aquarium I set up a woodland environment as close to a toad's natural one as possible. On the usual one inch base of coarse gravel and charcoal I brought in non-sterile soil from my compost pile, some intriguing pieces of rotting wood, a few small earthworms and, I hoped, other small creatures that would produce the necessary action. A shallow ashtray became the woodland pool camouflaged with a rock ledge leading to a miniature cliff. Walking fern *(Camptosorus rhizophyllus),* partridge berry *(Mitchella repens), Hepatica americana,* maidenhair fern *(Asplenium trichomanes),* a tiny hemlock seedling, and moss transplanted from our moist hillside awaited toad. He was a small, ordinary American toad, *Bufo americanus,* with a dry, warty skin. Frogs, in case you are unsure of the difference, have moist, smooth skins and they leap. To keep a frog happy requires more water than plants and considerable care to maintain an attractive habitat. Perhaps, eventually, I would try a frog, but for now, a toad was perfect. Toads hop

Somewhere along the evolutionary scale, I think my family was slow getting out of the swamp.

and mine hopped and ambled through the miniature woodland until he was familiar with every inch. Then he burrowed into a little cave under the "cliff." Only the tip of his nose and vague bulges of eyes showed. I began routinely dropping small insects at the mouth of the cave. Toad immediately inched out and, fixing his prominent eyes on the prey, shot out his tongue for the kill almost faster than I could see.

My housekeeping habits changed. I delighted in the tiny spiders that appeared occasionally in a corner. Somnolent flies were a prize. A spider egg case, moved into the terrarium, soon hatched a multitude of tiny spiders tricked by the warmth of the terrarium. These kept toad busy for days as they spun little webs in odd corners, first out of his reach but eventually dropping to the range of that lightning tongue. Another life cycle was triggered ahead of schedule: from the carpet of woodland moss and its undisturbed soil, hatched long-legged mosquitos. As their brown chrysallis-like cases stood empty in the moss, toad sat full in his cave, having eaten every one. The outside night light on our covered porch attracted a variety of winged creatures that were easily captured with a small jar and piece of cardboard slid underneath. Miller moths thus captured lived in the terrarium for days until a fatal flight brought them into toad's range. In the warm December of 1979, again on my outdoor porch, I caught some strange, wingless, grey insects in considerable numbers.



From *Rustic Adornments for Homes of Taste,* Groombridge & Sons, London, 1870.



photo by Mary Lou Wolfe

Lighted terrarium, home of toad and salamander, completely fills the north window in the living room.

Later I read that these were the wingless female moths of the cankerworm or "inch-worm" which emerge in autumn to lay their eggs. Toad went overboard on these and became imposingly rotund. Then, the strange warm December suddenly shifted into normal January cold. Toad, well fed and cool (60°) in the north window, disappeared into the woodland soil. I would often turn on the terrarium's fluorescent light those winter nights hoping to see him on a midnight prowl, but he stayed put in his hiding place. Respecting Conant's directive "a minimum of handling," I resisted peeking under the likely places and let him hibernate.

a 20th century hobby

I thought of my interest in amphibians as a 20th century hobby, rather recent like skiing or surfing. But looking at 19th century indoor gardening books in the PHS Library changed my mind. Our Victorian ancestors seem, if anything, more intimate with their pets. From Hibberd's *Rustic Adornments for Homes of Taste,* 1870, comes this charming picture of a frog in an inverted bell jar, the top covered with gauze. The accompanying instruction directs: "Once or twice a week they should have liberty to leap about and climb the window, to catch flies for themselves. . . They become very tame, and will sit on the finger, and leap from it when the buzzing of a blow-fly arouses them." Roger Conant would not approve and neither do I, and I speak from recent experience. Last fall, after a very dry summer in Philadelphia, I searched in vain for a toad to replace the one I had liberated in June. I even asked my colleagues at PHS to watch out for a toad for my terrarium. One Friday a sizeable cardboard box arrived in the library. "Does it have a dry skin and warts and hop?" I asked as I gingerly opened the lid. No! It was a moist, smooth skinned Leopard frog. It leapt over the book return counter onto the library carpet. After several trips around the spiral staircase, frog was finally gently cornered by a determined Lindemann/Wolfe team and returned to the box. Frog was transported out, bedded in moist paper towels and is alive and well in the mud of my lily pond. Those Victorians had a way with frogs or else Mr. Hibberd had a way with words.

In early April, toad reappeared looking lean and, I thought, a bit haggard. I dropped in some meal worms I had purchased for winter feeding from an aquarium store and he ate them all. The compost pile produced some worms and sowbugs. He was ravenous and soon plumped out to his former rotund shape. Early in June I released a toad that had doubled in size and, I hope, was not spoiled by life on Easy Street.

This fall I switched to a basic low light, cool, exotic jungle. My 30 in. long aquarium with a fluorescent lighted lid completely fills the bottom half of a living room window. It's planted this year with some handsome sculpted stones picked up on an Olympic beach and has a sunken, gray-green ceramic pool bordered by creeping fig *(Ficus pumila* 'Quercifolia') and is overhung by a perfect, miniature gnarled branch. Sinningias send up tiny purple trumpets beside the pool. Everything is ready for a new toad tenant but my toad hunt flopped. I settled for a red-backed salamander *(Plethodon cinereus)* from under the wood pile. This creature is terrestrial and appears mostly at night slithering through the sinningia. Out of desperation I've put a fake creature in the pool. Its skin is smooth, it has no warts and it hasn't leapt yet. If you know of any princes about to be transformed, tell them about my cool, verdant jungle and bring them to the PHS Library in a large box. Mark it "Prince" and I'll do the rest.

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PHS horticultural librarian Mary Lou Wolfe invites you to visit this year's terrarium tenant at the PHS library during January. Wolfe advises us that her toad and frog hunting skills were honed to a fine edge in the Indiana Sand Dunes when she was growing up in the Middle West.

Recommended Reading on Terrariums and Vivariums Available in the PHS Library

Bottle Gardens and Fern Cases, Anne Ashberry, Hodder and Stoughton, London, 1964.

The Complete Book of Terrariums, Charles Marden Fitch, Hawthorn Books, New York, 1974.

A Field Guide to Reptiles and Amphibians, Roger Conant, Houghton Mifflin, Boston, 1958.

Fun with Terrarium Gardening, Virginie and George A. Elbert, Crown Publishers, New York, 1973.

Gardens in Glass, Mildred Norton Andrews, A. T. De la Mare, New York, 1934.

Gardens Under Glass, Jack Kramer, Simon and Schuster, New York, 1969.

**Rustic Adornments for Homes of Taste,* Shirley Hibberd, Groombridge and Sons, London, 1870.

†Small Habitats, Lilo Hess, Charles Scribner's Sons, New York, 1976.

Successful Terrariums, Kim Kayatta and Steven Schmidt, Houghton Mifflin, Boston, 1975.

Terrariums, John Hoke, Franklin Watts, New York, 1972.

*reference only
†especially recommended

Periodicals

The Terrarium Association, 57 Wolfpit Avenue, Norwalk, Connecticut 06851 $7.00/year. Provides list of foliage plants for growing in covered glass containers, sources for plants and four times a year *Terrarium Topics,* which covers some aspect of terrariums.

Chrysanthemum Cascades

by Godfrey Bruckhaus



photo by author

White Daphne

A well-grown cascade is one of most rewarding forms in chrysanthemum culture. Although they require a precise program of training, pinching and fertilizing, there is no reason why any grower with enough patience should not be successful.

My initial experiences growing cascades here in the Northeast were disappointing. The cultural information available was good, but the time schedule for final pinching and training was not directed to growers in this area. I developed a satisfactory schedule and also made some cultural adjustments.

getting started

At the end of the season I cut my plants back to about 4 to 6 in. Then I put them in the basement under lights for 13 hours a day. By the end of January or the beginning of February the plants have enough growth to take cuttings. Cascades need a long growing season and should be started as early as possible to ensure a large, full specimen. They can be started later but a smaller cascade will result.

My cuttings are about 3 to 4 in. long. They are planted in a rooting medium that is one half sand and one half peat moss in a 3 in. x 12 in. x 18 in. seedflat about ¾ to one in. deep. Before planting, the rooting media should be wetted down. When the flat is planted I put a wire frame over it so I can cover it with plastic to contain the moisture. They need constant watch so they won't dry out, and they need 13 hours light; otherwise, they go into buds. Cascade plants are also available from Kings Mums and Sunnyslope Gardens, both in California.*

At this time of the year they take about two to three weeks to root. When they are rooted they are planted in a 4 in. pot in a Cornell type mix: peat moss and perlite plus some nutrients. These plants are kept in a greenhouse or basement under lights. During this period they must continue to receive 13 hours of light daily to prevent premature budding.

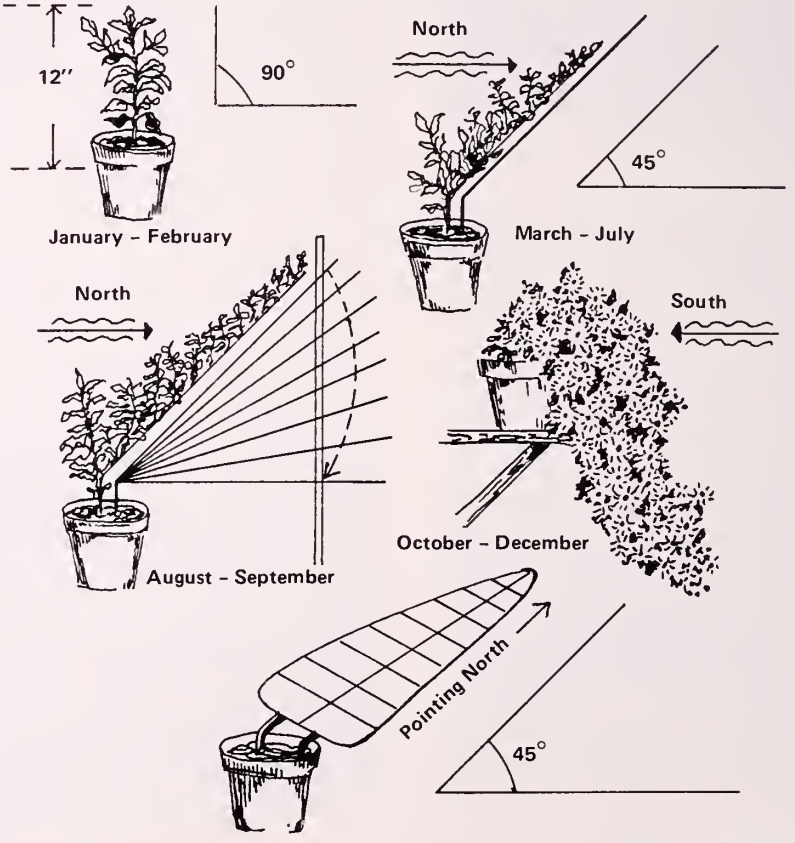
When the weather permits, the plants are placed in their final pots and moved outside. The pot I use is heavy plastic and measures 10 in. in diameter x 10 in. deep. The potting mixture is two parts soil from my disbud bed, which already has 5-10-5 fertilizer, lime and superphosphate incorporated, one part peat moss and one part perlite.

I found that two plants per pot are necessary to achieve a full cascade. The soil is kept 1½ in. below the rim of the pot to allow for maximum watering. When the plants are settled, the wire frame should be placed in the pot (see illustration). This frame should be in an upright position and leaning 45° to the north. As the plant grows it should be tied to the wire frame with twistems or similar type ties.

For the frame, I use 10 gauge galvanized wire, shaped to the form and size that I expect the plant to achieve. This frame may be covered with chicken wire or crossed with a series of separate wires.

Now the training starts. Before the final potting some pinching will already have been done to induce branching. Generally, the lead is left growing. Occasionally, it will get too far ahead of the rest of the plant and will have to be pinched, and a new lead will be started. All the laterals are pinched after the second or third leaves have appeared to keep the plant compact.

The Growth Cycle of a Cascade



*See Sources for Cascade Plants at end of article.

This pinching will continue with no interruptions until August 20.

A constant supply of nutrients is extremely important to a successful cascade. One year in mid-August my lower foliage started turning purple. Thinking it was a deficiency of some type, I checked all possible references to identify the cause of this problem. In my search, I came upon a section in the *Cornell Manual* recommending fertilizing pot plants after every sixth watering. In this period of hot weather and heavy top growth I was watering two to three times a day, and leaching out the nutrients before they could be absorbed. That simple explanation should have been obvious. Now I fertilize after every sixth watering, alternating Peters 20-20-20 or Miracle-Grow, fish emulsion and 15-10-30 at the rate of one tablespoon per gallon of water. Occasionally, I will add a couple of tablespoons of epsom salts to the fertilizer to avoid magnesium deficiency. This program eliminated the foliage problem, and has resulted in stronger, healthier plants.

The last complete overall pinch is made on August 20. The center third of the plant is pinched again on August 23 and the terminal point of the plant is pinched on August 27. This important series of time pinches will bring the whole cascade into bloom at the same time.

After the buds have developed, I spray B-Nine on the whole plant till it drips. It reduces the length of the pedicels, and forms a tight attractive plant. B-Nine is applied at a 25% strength, which is five teaspoons of powder to a gallon of water.

On September 15 I turn the plant 180 degrees from north to south and gradually bend it down to form the cascade.

Isotex and malathion sprays have successfully controlled insect damage. Benlate has eliminated all fungus and mildew problems.

My favorite cultivars for cascades are Daiset-Susan, Seizan, Megumi, Daphne-white, pink and yellow. For trees the Daphne grows a heavy stem. Others are Maiko, Texas Gold and Ginger Ale.

I have only talked about cascades but all the other shapes, fans, hanging baskets or tree-forms, are trained the same way, only the shapes are different.

All this may seem like a lot of work but, when the thousands of buds on your plants burst into color in mid-October, you will be well rewarded.

●

Godfrey Bruckhaus belongs to the New Jersey State Chrysanthemum Society, chapter of the National Chrysanthemum Society. He's a master judge in that Society. He raises chrysanthemums as a hobby and his major interest is planning for exhibits and shows.

Sources for Cascade Plants

Kings Mums
3723 E. Castro Valley Boulevard
Castro Valley, CA 94546
(415) 582-7172

Sunnyslope Gardens
8638 Huntington Drive
San Gabriel, CA 91775
(213) 287-4071



photo by Gottlieb Hampfler, Dept. of Horticulture, Longwood Gardens, Kennett Square, Pa.

CASCADES AT LONGWOOD

Longwood's display is especially famous for over 100 breathtaking cascades that drape the conservatory walls and columns like waterfalls. The largest "curtain," made up of several cascades, contains about 150 square feet of flowers. Cascading upwards are free-standing columns and arches that add linear elements to the design.

Equally as impressive are 27 hanging baskets of mums forming globes 5 ft. in diameter. As with the cascades, a year-long training program of pinching and shearing to induce maximum branching produces hundreds of flowers on each plant. A basket with ten plants yields thousands of flowers per globe.

These cascades, baskets and trees are on display at Longwood each year throughout November. Longwood extends its usual 10 am to 5 pm hours during the Thanksgiving holiday until 9 pm. These extended hours will be observed in 1981 on November 26, 27, 28.

The Holly Collection at Swarthmore



photos supplied by Arthur Hoyt Scott Foundation

A combination of technology and the human touch are needed during the move to Swarthmore.

This is the story of a man who made an important contribution to horticulture through his generosity and love for collecting. My grandfather, James R. Frorer, born in 1893, collected with a vengeance. He amassed a locally famous collection of over 4,000 Quaker publications dated to 1656, a mineral collection specializing in the Piedmont Region valued at $80,000, and a collection of hollies, Holly Walk, which is the subject of this article. Educated in chemistry at Swarthmore College, he received a B.A. in 1915 and later went to work for the Dupont Powder Co., eventually retiring as a vice-president and member of the Executive Committee of Atlas Chemicals, Inc. Though Frorer was not a trained horticulturist, his love and enthusiasm for hollies won him respect among holly lovers and got him elected vice-president and trustee of the Holly Society of America.

Holly Walk, his collection of hollies, was inspired by George Washington's planting of American holly at Mt. Vernon in which groups of three grew together for form a single head. Growing holly for the first time, Frorer tried this method with three seedlings. He continued to collect for over 40 years until the three acres surrounding his house just north of Wilmington, Delaware, contained over 600 plants. In the beginning, this Holly Walk was loosely modeled after the holly walk at Kew Gardens in England where ilex varieties grow amidst golden yews and Irish, English, and dwarf boxwood creating a rich evergreen border. As the collection grew, however, it became simply rows of plants.

Even then, each plant always received the best of care, enabling Frorer to grow tender species to impressive sizes. The soil around his house was uncooperative, a heavy, clay loam not preferred by hollies. Consequently each plant was given a good start in a

College

by Andrew C. Durham



James R. Frorer (left) and Harry Foulke discuss *Ilex latifolia.*

generous hole of prepared soil (1/3 sharp sand, 1/3 peat, and 1/3 good topsoil or compost). The site was well protected with trees and shrub borders on most sides, many of the plants growing directly under the high shade of mature oak trees. Newly planted hollies received a heavy mulch and burlap protection from the winter wind and sun.

The collection contained many plants rarely cultivated in the Delaware Valley, obtained by Frorer from his numerous contacts and worldwide travels. New releases from the Beltsville Experimental Station were automatically sent to Holly Walk, at one time the largest holly collection on the East Coast (Calloway Gardens in Georgia has since developed a larger one). One of the most talked about specimens is a rare species from Central China, *Ilex chinensis,* which has evergreen, oblong leaves similar to those of the common peach *(Prunus persica).* Scarlet fruits are borne in loose cymes after flowering and adorn the densely, pyramidal shrubs through the winter. Frorer nurtured two of these Zone 7 plants to heights of 18 ft. in 20 years.

As Frorer grew older and the collection grew in size, he decided to donate it to an institution that would permanently display it for the public's benefit. The most logical home for the collection was Frorer's alma mater, Swarthmore College, and the Arthur Hoyt Scott Horticultural Foundation. This foundation was established at Swarthmore College in 1929, 14 years after Frorer graduated, with the purpose of "encouraging horticulture by visual demonstration." Since its inception, this non-profit organization has won international recognition for its collections of flowering cherries, magnolias, rhododendrons, lilacs, and daffodils, and thus was already adept at handling a collection the size of Holly Walk.

transplanting

The Scott Foundation, having accepted the collection, began preparations for transplanting in 1973 with the actual move slated for the following summer. A gift of $100,000 accompanied the collection to cover the cost of moving it and to set up an endowment fund for future maintenance. While holly should normally be transplanted in early spring before growth resumes, a summer move was decided upon for two reasons. First, due to previous commitments, the landscape contractor was unable to promise enough equipment and manpower to assure a quick and uninterrupted job; second, unpredictable spring weather could halt the project for weeks at a time, endangering any plant half dug or in transit. However, before any plant could be moved, Holly Walk had to be cataloged and labeled, and a site chosen for the new James R. Frorer Holly Collection.

Harry Foulke, grounds foreman at the College, and Joseph Oppe, director of the Scott Foundation, spent many hours selecting a suitable home for the collection. Crum Creek Meadow, on the edge of campus, was finally selected. Sitting in a small, forested valley, the meadow slopes gently down to a flood plain and finally the creek. It faces the southeast (the ideal exposure for evergreen hollies is on the north or northeast side of a building), but is well protected because the slope and trees discourage the worst winter winds from the north and west, and because of its location in the valley.

The contractor's crew then moved in and began what would take six weeks and almost 6,000 man hours before 450 holly trees were moved a distance of 20 miles.

Anticipation turned to excitement as July 8, 1974, the first day of transplanting neared. After all, this was no small undertaking; it would be years before the collection could be considered settled in. Several of the trees were up to 20 ft. tall and 12 ft. broad, requiring root balls of 8 ft. ot more.* Before a root was disturbed, each plant was sprayed with an antitranspirant to help reduce moisture loss while under stress. The contractor's crew then moved in and began what would take six weeks and almost 6,000 man hours before 450 holly trees were moved a distance of 20 miles. The majority were dug with a 44 in. tree spade, excepting small plants easily dug by hand and plants too large for the machine to handle, which were also dug by hand. Balled and burlapped, the trees were trucked to Swarthmore where another crew unpackaged them and eased them into newly prepared holes. They were pruned back as much as 50% to compensate for root loss and watered immediately. A temporary irrigation system pumped water from

continued

*The necessary size of rootball for each plant was determined by the rule of one foot of rootball per inch in trunk diameter.



photo from Arthur Hoyt Scott Foundation

James R. Frorer Holly Collection at Swarthmore College

the creek at a rate of 200 gallons per minute to quench the thirst of 450 plants.

Foulke, responsible for the design, gave much thought to grouping the individual plants by country of origin or botanical similarity, but the arrangement of the plants in Wilmington prevented this. Many of them were grown together and the small paths at Holly Walk didn't allow for a clumsy tractor. That meant the hollies had to come out in a certain order and go back in the same order. As a result the design goals became a pleasant viewing experience requiring little maintenance. The specimens are arranged in bold, irregular beds separated by wide, grassy paths. Consideration was given to the needs of each plant. Deciduous species native to eastern U.S. swamps, such as *Ilex verticillata* and *I. laevigata* (the common and smooth winterberries), were planted at the bottom of the slope in a moist area. Variegated cultivars of the English holly, such as *Ilex aquifolium* 'Silver Queen' and 'Aureo Marginata,' were tucked into the edge of the woods for protection—these are known to be less hardy than the species. They were later moved again, for more protection as they were burned several times. Variegated hollies tend to lose all or part of their variegation when grown in the shade. Several large Irish boxwoods, a tall, columnar form, were also brought from Holly Walk and used with *Cornus florida* 'Rainbow,' a variegated dogwood, as accents within the collection.

Not all of the Frorer hollies made it to the Crum Creek Meadow. Two small displays were planted using some of the better varieties—one at the entrance to the collection (a short walk is required) and one in front of the Thomas McCabe Library on the main campus, a building donated by a classmate of Frorer's.

Now, more than six years later, the collection has prospered and gets more attention from the public each year. Some of the plants are still struggling to adjust but most have recovered from their heavy pruning and the transplanting that left them looking shabby for a while. While the first and most crucial winter, of moderate temperature and adequate rainfall, was kind to the collection, the plants were later tested with three record breaking winters—two for low temperatures and one for snowfall—and have proven themselves established. The only plant to be lost before cuttings were taken was *Ilex integra,* a large fruited evergreen from Japan. A tender species from the South, yaupon (which bears the descriptive epithet of *Ilex vomitoria* because its leaves were used by Indians to prepare a bitter drink) also suffered losses. Originally eight were transplanted, but today only one remains, five having perished during the first winter.

One of my favorite species, *Ilex pernyi,* has gracefully arching branches and an open habit in shade; however Reginald Farrer calls it a "graceless little, dumpy shrub." You'll have to decide for yourself.

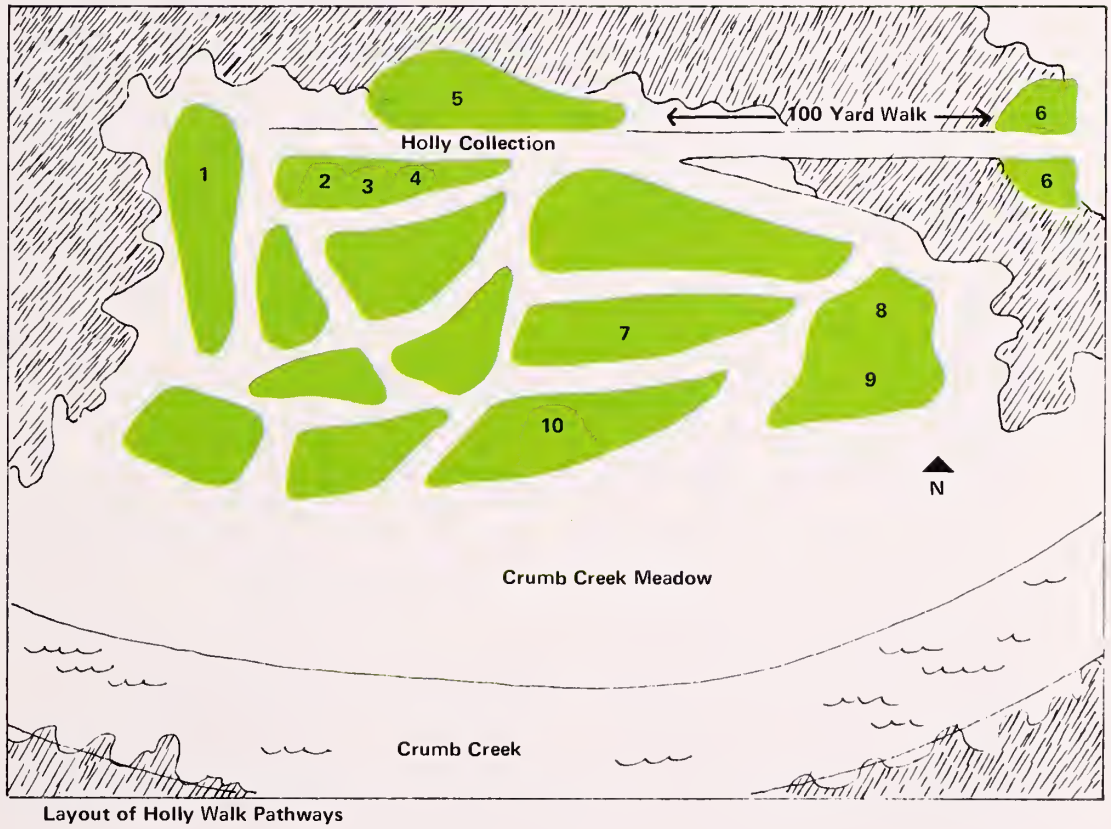
The college and the Scott Foundation are proud of this addition to the campus and the collection has been the center of attention on a number of occasions. In 1976, the Holly Society of America held their annual meeting in Philadelphia and made a special trip to Swarthmore to view this collection. Various short courses and walks offered by the Scott Foundation have focused on the genus *Ilex,* using the Frorer hollies as a teaching aid. Small plants, propagated from the collection, are often offered for sale to help raise funds and distribute the better varieties. But perhaps the most consistent visitors are the students and inhabitants of Swarthmore who visit the area for recreation and relaxation.

continued



Swarthmore College Special Gardens: (1) Dean Bond Rose Garden, (2) Harry Wood Memorial Garden, (3) James R. Frorer Holly Collection, (4) John C. Wister Rhododendron Collection and (5) Wister Garden (735 Harvard Ave.).

1 **Variegated varieties of holly**
2 **Irish boxwoods**
3 **Yellow fruited hollies**
4 *Ilex xanthocarp*
5 *Ilex latifolia*
6 **Blue hollies**
7 *Ilex pedunculosa*
8 **Deciduous hollies**
9 *Ilex verticillata*
10 *Ilex pernyi*



Layout of Holly Walk Pathways

rare species and unusual cultivars

Many interesting species and cultivars can be found in the collection, though fanciers of American and English hollies are especially lucky as 56% of the collection consists of variants of these. Yet the variety of this genus will surprise you as you begin to notice the rare species and unusual cultivars. *Ilex latifolia* from Japan, for instance, is a species rarely cultivated this far north. Known as the lusterleaf holly, it bears the largest flower clusters and leaves of any holly, making it quite conspicuous in the landscape. It is very tender in this area, often dying back, but Frorer managed to grow 12 ft. tall plants in 13 years. Another species from Japan and Central China is the longstalk holly, *Ilex pedunculosa,* named for the unusually long berry stems (peduncles) that give this shrubby tree a distinctive effect. It is a reliably hardy, evergreen holly (Zone 5) that forms a good, narrow upright habit. The multistemmed shrub is dense with shiny, dark-green leaves resembling those of laurel. This species was introduced in 1892 by Charles S. Sargent, founder of the Arnold Arboretum—it should be more popular by now. One of my favorite species, *Ilex pernyi,* has gracefully arching branches and an open habit in shade; however Reginald Farrer calls it a "graceless little, dumpy shrub." You'll have to decide for yourself, but the small, spiny, evergreen leaves placed regularly along the stem and its unique habit make this holly worth getting to know. The well known blue hollies *(Ilex* x *meserveae* cultivars*)* can be seen in the collection along with both of the parents—the English holly and a low spreading holly from Northern Japan, *Ilex rugosa.* Because of its compact form and small size (no more than 4 ft.), this small-leaved, evergreen plant is suitable for the rock garden or the foundation. This is the only truly prostrate holly, slowly spreading to form a mat. It is totally hardy (Zone 3) and enjoys shade in this area for best growth, which can be said for few plants.

The James R. Frorer Holly Collection represents 223 different taxa and has something of interest for everyone —designers, botanists, horticulturists, and homeowners. When everything else outside reminds you of frigid weather and death, hollies sparkle defiantly against the cold and reassure us that life has stopped only to rejuvenate itself. This is the time of year to admire holly. Go just after a fresh snowfall when the white blanket highlights each branch and makes every tree cry out for attention. Go to educate yourself on the attributes of holly and to enjoy the sylvan setting.

●

The Arthur Hoyt Foundation of Swarthmore College
Swarthmore, Pennsylvania 19081
Phone: (215) KI 5-5380

On the 330 acre campus, the visitor will find a collection of more than 5,000 kinds of plants. In addition to the holly collection, its tree peonies, magnolias, lilacs and flowering cherries have earned national reputations. The holly plantings have been designated an official Holly Arboretum by the American Holly Society. The collections were originally established by Arthur Hoyt Scott as a garden of suggestions, a display of the best ornamental plants recommended by professional horticulturists for Delaware Valley gardens.

Andrew C. Durham is in his senior year at the University of Delaware majoring in plant science. He hopes to work for a year at the Royal Horticultural Society's Garden at Wisley, England after he graduates. Durham has worked in several first rank private gardens in the area and for the Arthur Hoyt Scott Foundation, Conard Pyle Corporation and a small experimental nursery with Dr. J. Franklin Styer all during summers and part-time while at the University. He notes that his own garden, built on a hillside around a log cabin (five miles north of Wilmington, Del.), is now six years old. His one holly tree, a yellow fruited *Ilex opaca,* died this year after he transplanted it.

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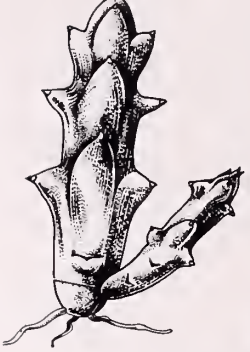
A woodland garden.
See page 4.



THE green scene

HORTICULTURE IN THE DELAWARE VALLEY
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The Lenten Rose at Winterthur Museum Garden in Delaware
See page 35





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THE green scene

HORTICULTURE IN THE DELAWARE VALLEY

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Front Cover: Flowers in the foreground are the lenten rose *(Helleborus orientalis)*; middle ground: lavender flowers are *Corydalis bulbosa,* and some primroses; and tall pink shrubs are *Rhododendron mucronulatum* and *R. m.* 'Cornell Pink.'

Photo taken by Gottlieb Hampfler at Hellebore Walk at Winterthur Museum Garden in Delaware.

Back Cover: Astilbe sp. Perennials for Pleasure on page 12.
Photo by L. Wilbur Zimmerman



plant survival

by J. Franklin Styer

Darwin speculated on the origins of the species and the genetic changes that contributed to survival. Science now takes increasing advantage of its ability to manipulate genes, often to our great benefit. As a result, science suggests that plant species and varieties in general should be preserved for possible future use. Unfortunately, many are already being lost.

It is quite true that more effort has been expended to eliminate some plants, like poison ivy and Canada thistle for example, than to conserve in the plant kingdom. The reason can be found in the numbers of plants, of which the soil inhabitants alone are probably 500,000 species. Who worries about those that become extinct? Well, some of us do — and that list is said to include over 50,000 lost in the last 100 years.

Conservation cults mainly refer to animal life, with the notable exception of the redwoods. But these worthy people are beginning to realize that the basic element, **which alone keeps the animals alive**, is the plant life. No wilderness is static; the plants therein are struggling against one another and the fauna as well.

The layman may presume that a small list of species may provide all that the human population will ever need. That is not so, for two reasons; only a few hundred plants have ever been considered in the context of survival, and basic genetic research has not reached a point where its best direction is clear. Plants provide so much: food, drugs, fiber, fuel, scenic values, protection from sun, wind, landslides, floods and erosion.

Consider wild rice. It had no economic value whatever until a single genetic variant was discovered and propagated, whereupon it became a new industry and incidentally, no longer "wild."

Plant conservation will go on in the wild and also in gardens of many types. The cost of conservation is considerable and the profits cannot be calculated like offshore drilling. The earliest American effort (surprisingly a long time ago — 1872) was made at the Arnold Arboretum in Jamaica Plains, Massachusetts. The arboretum connected with Harvard University was endowed to preserve all the trees that could be grown in Boston. Perhaps the latest is the arboretum established by Harold Hillier in Winchester, England to preserve the many thousand items now grown in his nurseries. It has been donated to his local county council.

The number of plants to be grown and protected in the wild is enormous.

"Only a few hundred plants have ever been considered in the context of survival."

No one agency can take on more than a small portion of the list, which will include varieties and cultivars as well as species. The agencies to carry on this work must be located on all the continents and major islands.

The care of the plants will last through generations, not just years.

There must be one agency, however, devoted exclusively to guidance of all the others in setting priorities, compiling records, keeping track of all local progress. One most interesting duty of that agency would be searching for endangered species and even checking the health of the food supplies of endangered animal species. The logical agency would be the present International Institute of Horticultural Science, headquartered in the Netherlands.

Regional master agencies will take on the care of plant groups assigned to them by the international body and recruit and direct the clubs, societies, colleges and arboretums in their territories. Their field botanists will watch the state of the wild flora. England, always a horticultural leader, has already established a national committee for this purpose.

The American Horticultural Society is logically the appropriate agency to assume this program in the United States. It was organized before 1950 (as the American Horticultural Council) with the aim of handling just such matters of national and international import. That Council instigated the writing of the Code of Nomenclature and the formation of the present Congresses and other international machinery. Unfortunately, the essential cooperation of the many American horticultural societies and clubs has been lost by AHS through organizational errors. Correction of this situation is, in our opinion, an urgent matter.

Garden clubs, societies, botanical gardens, colleges and other institutions are recommended as owners and operators of the gardens that will be the real effort of preservation, because they command groups of people, can act with less cost and can provide continuity over the necessarily long periods of time.

I think the dialog in the form of the publication of Betsy Shuman's article about the sale of Raraflora (*Green Scene*, January 1980) and Elizabeth Hume's response (March, 1980) show that the individual, too, is ready for such a program, but perhaps doesn't realize it. In fact, much of our "heritage" material is available today **because of**, rather than in spite of those 'tight little guarded greenhouses." Those gardens in England in the 18th and 19th centuries were tight, not public. Elizabeth Hume should favor gardens with guarantees of continuous care, and a good record of the location of all rare material. Perhaps some day PHS can survey the immediate area for this purpose.

This project of plant survival will be continuous through time. Our grandchildren deserve a strong and never-ending planned effort at conservation. Of all those assets, plant life comes first.

●

J. Franklin Styer has a collection of plants that he is using to improve container growing in nurseries. He adds to his experience as nomenclature chair of the American Association of Nurserymen by working in environmental movements. Styer heads the Delaware County Conservation Board and is a member of the Pennsylvania Conservation Council's Land Use Committee.

A Garden is a Journey, Not a Destination

(especially when you're planting around asphalt)

by Judy Mathe Foley

We were in the midst of renovating an old city house in the Spring Garden St. area when we acquired the "lot." Right away I did two things—I put in a forsythia bush as insurance against a bleak spring landscape, and I planted daffodil bulbs. For the two years before we had any semblance of a garden, the yellow forsythia would bounce in the March winds and the daffodils, urged on by an occasional application of bone meal, would brave bricks and rubble to struggle to the surface to announce the promise of spring.

Soon, however, as I got more impatient and my expectations rose, I hoped for other living things to extend the season—lush peonies to give a blush to May, tall delphiniums to remind me of a favorite childhood place, and phlox and brown-eyed susans to cut for bou-

Digging that hole took four hours with a pick, pry bar and a shovel if we were lucky enough to be able to use one at all and if we didn't run into an old foundation in the process.

quets for the house. Each time I'd try to get one step ahead, to plant "permanent" perennials, I would be disappointed. Either I'd get too ambitious, plant too many things and the roots would choke each other out, or my plantings would make it through the winter only to perish in unseasonable rain. Each year I'd ask myself if it was worth trying again.

The story of the greening of our city lot is a tale of false starts and lost perennials, of bad planning and plan changing, and of the realization that the lessons we'd so painfully learned in renovating a house applied, in spades, to the garden. But let me tell you how long it took to learn the latter.

fire: the impetus to get going

One morning about 3 am I awoke



photos by author

1973 - Before we owned the lot across the street. This photo was taken from our bedroom window. Here I first saw the flames of the burning car.

on the second floor of our three-story house that was still in a state of flux from the renovating. From my bed I could see flames through the uncurtained window that faced on a rubble-strewn lot across the street behind our house.

An abandoned car—one of a series left there from time to time—had been set afire probably by neighborhood kids who played in it—and the upholstery was now sufficiently blazing to send up the flames that woke me. Though there was no immediate danger and the fire company, in one of its frequent trips to our neighborhood, quickly extinguished the fire, that middle of the night adventure was enough to make us foolhardy. "That's it. I don't want to live that close to a fire hazard," I said to my husband. "Let's find out who owns that lot and see if we can buy it." So, purely for practical reasons and not out of any vision of what it might become, we purchased the 50 x 50 lot in the fall of 1972.

The first communication we had about it should have been ample warning of the ramifications of that late night decision. For several years a woman on the back street and I had been taking turns calling the Department of Licenses and Inspections to tow away each abandoned car as it appeared. Those reports had been duly filed against the owner who ignored them. So when someone in City Hall noticed a sales transaction, the citations came to the new owners—us. Luckily, when we notified city officials, they generously allowed us more than the requisite 30 days to clean up and fence off the offending property.

The same month we made settlement on the lot our son was born, so we patted ourselves on the backs for our "foresight" in snapping up this space where he could play. In our imaginations and the relative comfort —if you don't mind plaster dust and paint cans, which by this time we didn't —of our home that first winter we made

1975 - The first harvest from our garden.



1978 - Work in progress. Planter built before the patio. Grapevine very young. Planter also contains daffodils and forsythia mentioned in the article. Contrast small cherry tree with photo taken two years later.



plans for this 2500 sq. ft. of space. We ordered catalogs and bought books. *The City Gardener* took its place on our how-to shelves beside *The New York Times Complete Manual of Home Repair* and Elisabeth Bing's *Six Practical Lessons for an Easy Childbirth.*

I'd grown up in the mountains where nature provided the greenery without much help from anyone else. The city was barren of the violets and buttercups I loved as a child. So I wanted flowers, preferably in profusion and wild abandon. My husband, Dick, had tasty memories of his father's victory garden near Awbury Arboretum in Germantown. So he wanted those warm tomatoes picked and consumed on the spot and green beans that snapped when eaten raw. Free of the constraints of previous experience, we plotted our garden. Then spring came. And with it, reality.

Ever notice how all the gardening books show someone digging a hole with one foot barely resting on the

continued



Dick Foley picking cherries in June 1980. In addition to grapes and raspberries, we pick enough cherries for several pies each year.

shovel as it seems to ease itself into soft dirt? In our case digging that hole took four hours with a pick, pry bar and a shovel if we were lucky enough to be able to use one at all and if we didn't run into an old foundation in the process. As we worked neighbors stopped to chat, and we learned that our lot once contained a blacksmith shop and a house. When they fell down, their remains were bulldozed into the old foundations.

To keep this newfound space free of those rusting, flaming cars, we had to erect 50 ft. long, 8 ft. high fences front and back on dirt that was a combination of brick, tenacious pieces of lathe, hunks of plaster, Wissahickon shist and rusty automobile parts (not to mention the skeleton of a hapless dog we later unearthed while trying to plant a tree). Digging the 16 post holes necessary for the fences took more time than I have courage to recall. Suffice it to say that the first two years those fences, the forsythia bush and the daffodils were all we were able to accomplish of our ambitious garden plans.

Not that our purchase was totally without treasure—we had enough brick to build a bomb shelter, enough clay to start a pottery factory, plus a neat six-foot thick pile of asphalt left over from some long ago street repair. Neighbors were quick to point out the drawbacks. When I mentioned to a woman up the street that I planned a garden, she gently informed me that she hoped I knew there was no soil there. "It's only city soot that settled in and is too worn out to move along with the winds." Another wag was tremendously proud of his joke that if we were so foolhardy as to send a soil sample for testing, the word would come back: "Add soil."

ten tons of topsoil and the rain

Eventually that's what we did. Ten tons of topsoil for our vegetable garden arrived one afternoon as we got home from work. The truck dumped it on the perimeter of the property, the gate we'd so painstakingly built being about 1/8 in. too narrow to permit the truck's entry into the lot. As clouds threatened to let loose a storm of hurricane proportions and sweep our purchase into the gutter and down the street, we commandeered neighbors and passersby to help shovel it into two raised beds we'd built.

As we were scraping up the last shovelsful in the first tricklings of the oncoming storm, a friend stopped by with a teaspoon. Two weeks earlier she and her husband had lost part of a load of dirt to the rain. She said she'd heard our dirt had been delivered and brought the spoon to help. Despite her warped sense of humor, we invited her in for coffee as we savored the beginnings of our garden.

Digging up the asphalt fell primarily to me as Dick concentrated on preparing his vegetable garden. I discovered that asphalt is more inclined to move on a blistering hot day and eventually with a pick I managed to loosen it all. Once having dislodged it, however, the problem of what to do with those sharp, ugly, black hunks arose. I solved it by piling them in a front corner of the lot as the foundation for a "rock garden."

Developing a militant horticultural attitude was difficult. I retained latent tendencies toward entomology, having spent my youth carrying home caterpillars to a box where they made the magical transformation to butterflies. It took lost crops to rid me of caterpillar mollycoddling and to realize we were now on different sides of an ecological battle.

As with every other project in those years of our son's infancy, this one took longer than expected and in the interval I had to listen to endless comments about my asphalt garden. Amazingly enough, it worked. Once soil was added and the asphalt settled in, that small corner of the lot became one of its most permanent and satisfying features. To an expert, of course, "rock garden" is a misnomer. Oh, it does have some sedums, and I did drag some rocks from a mountain creek near my parents' home to add a hint of authenticity.

Since that space was the first and for a few years, the only, tillable place I had, it bore the brunt of my enthusiasm for flowers. It became home to hollyhocks, periwinkle, dianthus, columbine, a stand of iris, bleeding heart, grape hyacinth, and a profusion of daylilies that delight me every year with their unfailing will to survive even my son's annual spring tramplings. (Unfortunately he shared my enthusiasm for this "cozy spot" as he called it, and found it the perfect place to build roads for his toy cars.)

The ambitiousness of our vegetable plantings that year after we "added soil" overwhelms me now when I read the notes I kept. We planted beans, cucumbers, carrots, green onions, zucchini, radishes, beets, cabbage, peppers, tomatoes, eggplant, and pole limas. We even planted some asparagus though of course we got no crop that year, nor did we in subsequent years, and it has since been discarded. The opulence of the harvest hardly matched that of the planting, but with a great deal of pride we gathered those first vegetables from this place where dilapidated cars once sprouted. We took pictures before we consumed our crop, as much to prove it to ourselves as anything else. We also made sure to take a tomato or a cucumber or two to our neighborhood detractors to rub it in. In subsequent years we've reined in our enthusiasm and opted for the more manageable nurture of a few good tomatoes, peppers, radishes and maybe some lettuce.

recycling urban space

Having now satisfied our cravings for flowers and vegetables we looked with exhaustion on the unused and ugly space still left. Since it was unfit for plantings we decided to turn it into a patio and some grass. This phase of our gardening experience could be called "How we learned to stop worrying and love urban renewal." We recycled.

We "bought a sidewalk"—1,000 usable bricks to be exact—from Franklin Town developers and made a patio. We lugged home cobblestones from along the Delaware River near South Street where they were being bulldozed under in preparation for I-95; the chain link fence in the back was another I-95 rescue operation. We shored up our vegetable garden with joists from houses being torn down near us. When a neighborhood marble place had a going-out-of-business sale we bought a green marble bench that once graced a bank and used it to cap a raised brick planter. That planter, like many of our



The beginning of my "rock garden" which is really a pile of asphalt.

projects, began as a way to use the left-over brick, and escalated into a whole summer's project with an architect friend's offhand comment about the severity of recent winters and the necessity of digging a deep foundation. It will outlast our house.

If PHS veterans could have seen us as we stumbled along, the scene would have been akin to one of those mystery movies where the audience knows the villain is lurking outside, but the hero doesn't. You would have been shouting, "No, don't do that. You'll be sorry. Stop." In those early, no-soil years we developed a fondness for anything that would brave the clay and the heat. Even ailanthus seedlings looked good. They're green aren't they? And we didn't have to dig a hole, add soil, and drag a hose across the street from our house to water.

Developing a militant horticultural attitude was difficult. I retained latent tendencies toward entomology, having spent my youth carrying home caterpillars to a box where they made the magical transformation to butterflies. It took lost crops to rid me of caterpillar mollycoddling and to realize we were now on different sides of an ecological battle. We also tried domesticating some peat moss from the bottom of a vanished lake my father found. A year later the incongruous appearance of swamp grass in the middle of the city bewildered us until we heard my father say he once thought of mining the peat and selling it, but an agricultural agent told him sterilizing it would make the venture too costly.

Neighborhood gardeners warned me: "Don't plant mint. It will spread all over and choke everything else out." I did and it did. I've finally managed to get rid of most of it, but vestiges of mint along with the swamp grass are continuing reminders of my naivete.

In those days earthworms held a privileged position in our hierarchy of things. We wanted to encourage any worm willing to take a chance of surviving there, so if we turned up one by mistake we lovingly sent it wriggling back home in hopes it would multiply. Even now the discovery of an earthworm is liable to elicit shouts of joy and our eight-year-old lectures his young friends about not harming them.

We read the books. We knew we should plan. We drew up several, but the actuality bears little resemblance to any of them. I often succumbed to the charm of New Jersey roadside markets, picking up a clematis here, a climbing rose there. Sometimes I had no place for these acquisitions and would later have to move them. Some survived; some didn't. For complete novices, the books weren't helpful. Some showed estates and though we considered our "North 40" an estate, its size belied the plans. Other books showed postage-stamp-sized city gardens. So we went on automatic pilot, hoping it would "come out right in the end."

The lot became an extension of our house, an outdoor summer living room where we could escape the heat and picnic on a table friends gave us to celebrate the completion of the patio. Eight years later we're not "done," but we can relax there now without feeling pressure to do anything more strenuous than cut the grass. Even more amazing to us than the "before" and "after" pictures we took are the cycles of life that go on behind that fence: the dead sticks of the raspberry bushes that a week or two in April can turn green and bushy, the shedding skeletons of the grape vines that shoot forth frothy, pink-tinged buds that unfurl into yellow-green leaves, and the flat, smooth and smoky iris spikes that unsheathe buds resembling an exotic bird's crest then extend into fuzzy-faced flowers.

Our garden doesn't offer a panoramic view. It's a series of close-up snapshots. It's the happy serendipity of pink bleeding heart bending protectively over blue grape hyacinth, the face of a Johnny jump-up reflecting the sunshine yellow of sedum at its feet, and the prim and proper yellow-throated red tulips standing as paragons among the devil-may-care blowsiness of white strawberry blossoms. Far outweighing the niggling knowledge that we need to do something about the barren spaces that remain is the marvel of a freshly pulled radish or the miracle of a waxy, black-purple eggplant that follows a delicate mauve flower.

Dick once remarked jokingly, "Now I finally know how to fertilize my cabbage and when to plant the tomatoes, but it took a long time. You really shouldn't start a garden until you've already done a garden."

We began this adventure on a whim, not with a plan, but somewhere in the back of our minds was the thought that someday it would be finished, someday we would get a landscaped view worthy of magazine illustration.

We now realize a garden—like the house we're renovating and the child we're raising—is a journey, not a destination.

●

Judy Mathe Foley is managing editor of *The Episcopalian,* a national monthly newspaper of the Episcopal Church. She was one of the founders of the spirited, but now defunct, *Drummer.*

Vine of melon squash grows on a yew hedge and up dogwood tree. Liz Proud holds fruit.



photo by Helen Brunet

the melon squash

One vegetable that survived the drought last year.

by Helen Tower Brunet

When Liz Proud planted a few seeds in a small pot in the greenhouse last March, she didn't think much about it. The seeds were Thompson and Morgan's melon squash, one of several different varieties of flowers and vegetables she was trying last spring. March was a little early to start melons she realized, but she reasoned that the greenhouse was so cool (about 60°F) that the seeds would be slow to sprout.

"I should have known something was wrong when I went back a few days later and the seeds had sprouted," she said. She described the seed leaves as about the size of a quarter, and the first true leaves as large as sturdy African violet leaves. Out of sheer admiration she gave them a shot of Peter's Plant Food—the orchid mixture that she happened to have on hand.

Spring progressed, and so did the melon squash. By May it had been fertilized twice and repotted three times, finally ending up in a 6-in. azalea tub. Liz, feeling grateful that it hadn't gotten too big to move in the meantime, put it outside the first week in May where she planted it in the flower garden in a small area she keeps for vegetables—several tomato plants, a few Sugar Baby watermelons and some lettuce. She placed the melon squash at the back of the bed, so that it could amble along the ground the way melon vines are wont to.

"But," Liz explained, "it didn't grow on the ground like normal squash or melon, it grew straight up. First it grew up a crab apple tree in its path, then a dogwood tree. It was delightful—the yellow flowers, the size of large hollyhocks, were a definite addition to the garden. Then it decided to climb my neighbor's empress tree," she added with a sly grin, "I thought it really improved the tree, but my neighbor was not amused, so I had to cut that part back."

By the middle of July, the melon squash had climbed every vertical object in its path, clinging with its spiral tendrils, which Liz described as "definitely heavy duty." The flowers were wonderful, the huge leaves, shaped like zucchini leaves, were graceful as they swayed in the breeze.

Liz had begun getting used to the cars slowing down with drivers puzzling over the vast vine that enveloped her yard and grew back and forth on the yew hedge. "I sort of enjoyed the attention," she says, "but I did begin to wonder if we would ever see the fruit." Then the drought started.

". . . it didn't grow on the ground like normal squash or melon, it grew straight up. First it grew up a crab apple tree in its path, then a dogwood tree. . ."

By late July, the tomatoes began to wither, the Sugar Baby watermelon produced one golf ball and gave up the ghost. Liz was determined not to water anything in accordance with the town's ban on watering with a hose. She was too busy with jury duty to water the vine with recycled dish water. Finally, about to go on vacation, she broke down and gave it a quart or two of water in a bucket from the kitchen on August 11. She expected to come home to a skeleton vine unless there was rain in the meantime.

There was no rain in Northern New Jersey, but Liz returned from vacation to find the vine vigorous as ever, the yellow flowers nodding in the trees, while everything else was parched and brown. And there was fruit. The melon squash had produced four huge fruits, shaped like tubas, about the color of zucchini. They weighed 12 to 15 lbs., one measured 36 in. in length. By now it was September. Liz did not water it at all, even with kitchen sink water.

On October 1, these pictures were taken. The vine was still going strong, and the fruits were glorious and beginning to turn golden at the large end which signaled ripeness. Liz didn't hold out much hope for the taste of the large funny looking melon squash she offered me when I finished photographing her prodigy. We both felt the melon squash deserved high marks for showmanship if nothing else.

I cooked the squash with the skin on, simmering it for 20 minutes in a little chicken broth with a sliced onion. Liz tried one the same night, baking it in the oven for a half hour, sprinkled with lemon juice. We conferred on the phone after the taste test. Absolutely delicious was the verdict in both cases. The flavor was anything but bland. Rich, slightly nutty, but not really sweet. A winter squash with a spring taste, something like that.

Next spring, melon squash is a must on my list. If we are lucky and have sufficient rain the fruit will probably be bigger and more numerous, and if we don't, at least there will be one thing left in the garden.

Thompson and Morgan's American address is Box 100, Farmingdale, NJ 07727. Phone 201-922-0028. The melon squash is an exclusive with them, listed in last year's catalog under "Exotic Vegetables."

●

Helen Tower Brunet is a garden writer whose column "Gardening Indoors," appears in *Yankee* magazine. She is a frequent contributor to *New York Times* and has written a book on house plants, *Green Grow Your House Plants.* She gardens in a cold porch, under lights, in a homemade greenhouse and outdoors all summer.

New Ryegrasses— Best for Spring Seeding

by James J. McKeehan

Does your lawn have thin, sparse, or bare spots that will require seeding this spring? If you need to repair any lawn areas to insure a denser stand of grass for the 1981 growing season, you should select and plant some of the new varieties of perennial ryegrass available from your favorite garden center. In the Delaware Valley, spring seeding with Kentucky bluegrass and creeping or red fescues usually fails. However, better than 90% of the spring seedings made with the new perennial ryegrasses will succeed when planted in early March, April or early May.

The grass seed breeders have been working in recent years to improve common perennial ryegrass, and as a result, in today's market you can purchase many superior named varieties. Choose only the listed recommended varieties (beginning in the next section of this article) since some named varieties are not much better than common perennial ryegrass.

Common perennial ryegrass *(Lolium perenne)* has been used for years in grass seed mixtures. Its major features were rapid germination, low cost, and a guaranteed feeling that if all else failed in a seed mixture, the common ryegrass would grow. All too often what was expected happened. However, as the lawn aged, the negative features of common perennial ryegrass appeared. The features are wide, coarse-textured blades, difficult to mow (only a sharp mower cuts it cleanly and easily and most mowers are usually dull), too rapid growth, which shows up as clumps of grass that are taller than nearby bluegrass and fescues, giving an uneven overall appearance. Common perennial ryegrass has other poor features: it is not drought and heat tolerant, nor does it have good winter hardiness. All these negative features have relegated common perennial ryegrass to the category of a temporary lawn grass seed, even though it is a perennial.

The grass seed breeders realized the potential if some of the negative aspects could be eliminated. A number of breeders have worked with common perennial ryegrass and now the currently available better varieties feature: fine textured blades equal in appearance to the best varieties of Kentucky bluegrass, slow growth equal to bluegrass and fescue, easy to mow, adequate winter hardiness and heat tolerance, and improved drought tolerance. All these improvements resulted in the new fine textured varieties of perennial ryegrass that are persistent and truly perennial. The recommended varieties can be mixed with the better bluegrasses and fescues to form a compatible and suitable lawn. Some of the grass seed breeders who worked on improving ryegrass varieties are the agronomy departments of The Pennsylvania State University and Rutgers University as well as the research departments of International Seed Company, Northrup King, and Pickseed, Incorporated.

Better than 90% of the spring seedings made with the new perennial ryegrasses will succeed when planted in early March, April or early May.

recommended name varieties

The College of Agriculture of The Pennsylvania State University recommends eight named varieties of the new fine textured perennial ryegrasses. They are Blazer, Citation, Diplomat, Manhattan, Omega, Pennfine, Yorktown and Yorktown II. I would suggest that if you need to buy more than three or four pounds of seed, you split your total order between two or three varieties and mix the seeds together. The easiest way to mix the seeds is to place all of the seed bought in a large bag and tumble the seed for a few minutes.

Spring seedings of Kentucky bluegrass (sunny areas) and/or Pennlawn fescue (shady areas) usually fail in the Delaware Valley. Slow germination and rapid weed growth produce enough competition so that only the occasional seeding of this type is successful.

The fine textured recommended varieties of perennial ryegrass, which germinate quickly, have performed successfully when used any time from early March through mid-May to repair thin areas or to reseed bare areas.

The success rate of these grasses increases relative to the amount of soil preparation. Only a low percentage of grass seed will thrive if all the gardener does is broadcast the seed on an unprepared seed bed. Spading up bare areas one to three inches deep or vigorous raking of the thin areas about three-fourths to one-inch deep will develop a seed bed capable of a high percentage of germination and subsequent growth. Before tilling the soil, spread a light application of 5-10-5 fertilizer, about 1½ lbs. per 100 sq. ft., or an equivalent amount of a normal lawn fertilizer, over the area to be seeded. Tilling will mix the soil and fertilizer together, providing nutrition for the new grass. If soil and fertilizer are well mixed, the fertilizer won't injure the seed. Following seeding, lightly rake or drag the seeded area to insure that 1/8 in. to 1/4 in. of soil covers the newly planted seed. Roll or tamp the seeded area lightly to provide adequate seed and soil contact. That allows the seeds to absorb water to start the germination process.

The recommended varieties of fine textured perennial ryegrass are best suited for planting in sunny areas of your lawn. However, I would not hesitate to use them in areas of moderate shade (at least three to four hours of direct sunlight per day). When seeding bare areas, the seeding rate should be 4 lbs. per 1,000 sq. ft. When overseed-



Common perennial ryegrass stand about 18 months old, showing normal thinning out and weed invasion.

Comparisons of grass blade widths between two varieties of fine textured Perennial ryegrass and Kentucky bluegrass. From left to right, Pennfine Perennial Ryegrass, Merion Kentucky Bluegrass, Manhattan Perennial Ryegrass.



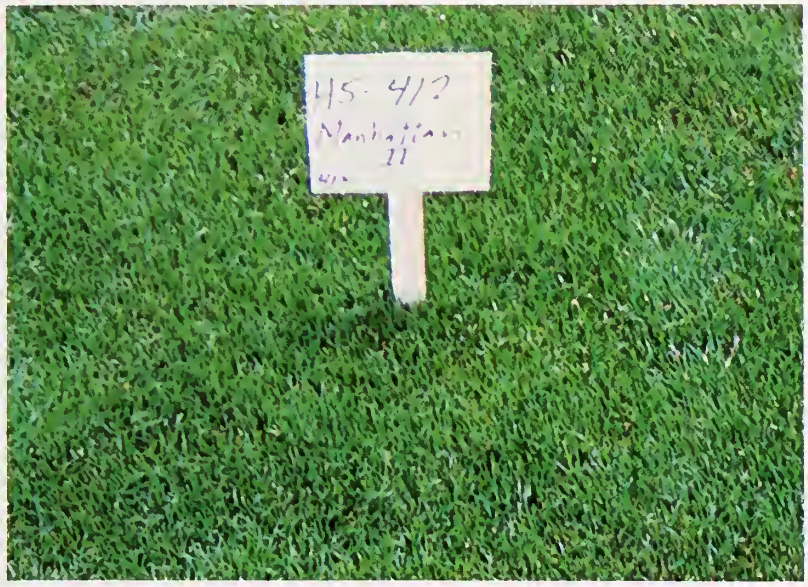
ing thin areas, use 1½ to 2 lbs. per 1,000 sq. ft.

Once the newly-planted fine textured ryegrass has germinated, mowing should begin as soon as the new growth exceeds the height of cut. For example, I recommend that most home lawnmowers be set at 1¾ to 2 in. height of cut. Once the growth exceeds the selected cutting height by about 2/3 of an inch the turfgrass should be mowed at normal intervals. The common practice of allowing newly-planted grass to grow to 5 or 6 in. tall and then be mowed down to normal height develops a stemmy thin stand.

The varieties of ryegrass recommended cost more than common perennial ryegrass by about 40%. However, there is no comparison between the new and the old. Longevity alone is worth the difference. Common perennial ryegrass lasted at best about two seasons of growth, whereas the new varieties are persistent, lasting more than five seasons. The cheapest component of any lawn is the best grass seed available. I strongly urge anyone who is planning to do some seeding this spring in the Delaware Valley to choose one or more varieties of the newly developed fine textured perennial ryegrasses. You will be pleased with the results and unless you know how to identify grasses, the new ryegrasses will look just like your bluegrasses and fescues. That's exactly what they were bred to do.

●

James J. McKeehan is the Delaware County agricultural agent for the Cooperative Extension Service, College of Agriculture, Pennsylvania State University.



Test trial plot of Manhattan II Perennial ryegrass about 20 months old. Note stand density.



Home lawn 100 per cent Pennfine Perennial ryegrass.

perennials for pleasure

by Mary S. Green

If you want a hurry-up garden and the maximum show for the minimum work, the easy way is to call in someone from a garden center or a contractor. They will fill your garden with bedding plants that last all summer long—petunias, geraniums, ageratum, marigolds—just as they do for the restaurants and garages they service. The only upkeep needed is deadheading, occasional weeding and paying the bill. The hitch, though, is that you will have to look at the same old garden week after week, all summer long; and that may become wearisome.



photos by L. Wilbur Zimmerman

Columbine

If, however, you really like gardening and are willing to spend some of yourself on it, you can follow the progression of the seasons and plan for a succession of different flower pictures—all by growing perennials. Putting together a perennial garden is like working on a big puzzle—one that will use all your talents. For while the painter works with two dimensions—length and breadth—and the sculptor juggles with three dimensions—length, breadth and depth—the garden artist has always to deal with the fourth dimension—time. While it is an aim of the perennial garden to always have something in flower, no two days are alike. Instead, as each major plant group comes into bloom, peaks and passes, it is followed by another. The result is constant interest and constant change.

It is tempting to expect from permanent plantings with perennials an effortless and labor-free garden. This is not, however, what you will have. For if your plants thrive, their clumps will expand, spread and need dividing. Generally speaking, division is probably needed about every three years. When plant stalks become spindly and bloom is decreased, it is time to divide. And it is wise to plan some dividing every year, so that you will not have to remake the entire garden at one time. To divide, dig up a clump, tear it apart into smaller, rooted sections, throw out the woody center, trim the side pieces with a sharp knife and replant. Generally, the best time to do this dividing is as soon as possible after flowering. This will give the new, little plants a full year to recover and resume vigorous blossoming. With very late bloomers, such as chrysanthemums, it is customary to wait till early in the following spring to divide.

Staking is necessary with many garden perennials, and the important thing is to do it before a heavy rain, not afterwards. You can use wooden or bamboo stakes from the garden center for spiky plants such as delphinium, which become top-heavy when wet. Or, if you live in the country where brush is available, this will give you something sturdy for plants such as blue sage to flop over. Sassafras makes particularly good brush for it is both sturdy and twiggy. Deadheading should be done once or twice a week, for a garden filled with brown and withered flower heads looks just plain shabby. And if the dead flower heads are cut off, you may get a second bloom.

starting early spring

The flowering season opens with the little bulbs and tubers, such as snowdrops *(Galanthus nivalis)* and winter aconite *(Eranthis hyemalis)*. They transplant easily, even in full bloom, so it is easy to try them out in new locations or in different color combinations. The white of bloodroot *(Sanguinaria canadensis)* and the blue of glory-of-the-snow *(Chionodoxa luciliae)* make a charming combination. Coming early in the spring when not much else is blooming, they are precious indeed. After a mild winter they may start blooming in early February. More usu-

ally, they come the first week in March.

The name bugloss has been given to a variety of very different plants whose only similarity is their pretty, blue flowers. One of the most useful is *Brunnera macrophylla* (Siberian bugloss), which blooms in early spring and is particularly good for planting in the herbaceous border. It has good, strong foliage, so is nice-looking even when the bloom is over. And it can take some shade, so is good for facing down shrubbery. A taller bugloss *(Anchusa italica* 'Dropmore') is planted for midsummer bloom, and is extremely good for the herbaceous border. This is easy to propagate by root cuttings. In fact, after moving a plant, new little plants will come up from any bits of root left behind. Both of these forget-me-nots should be used more often.

A little yellow goes a long way—particularly if it is the strong, intense yellow of *Doronicum* in springtime. The flowers are like big, yellow daisies, and they make excellent accent plants. The species *D. caucasicum* grows about a foot and a half tall, and it is a very useful plant if you want some yellow to wake up the perennial border. For a larger flower on a taller plant, among shrubbery, try *D. plantagineum.*

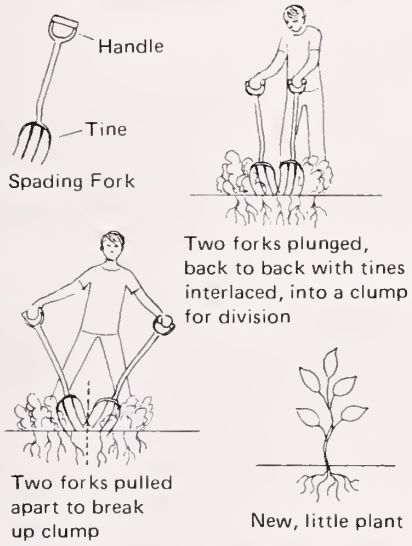
If you want a "conversation piece" in your herbaceous border, try growing jack-in-the-pulpit *(Arisaema triphyllum)* as a decorative perennial. It is not very colorful—until the brilliant scarlet seedheads are formed in late August to early September. But it is an interesting-looking flower and well-worth cultivation. It can stand growing on a well-drained, rocky bank or in semishade.

For many people, growing perennials means growing *Delphinium.* Unfortunately, delphiniums are difficult to grow in the Philadelphia area because of our hot and humid summer. The best way to insure a supply of these plants is to treat them like biennials. Start a new supply each summer from fresh seed, and carry the little plants over winter in a coldframe. This way, you will be sure to have new plants for the flower beds each spring. They are really beautiful plants—colorful and statuesque—and well worth a little extra trouble. Try fertilizing with a handful of superphosphate under a thick layer of organic mulch.

For sheer elegance in pink or white, it is hard to beat the gas plant *(Dictamnus albus).* It has tall spires of attractive bloom in spring, and good foliage throughout the growing season. Unfortunately, this plant exudes a volatile oil which can give a very bad burn. If you are really insistent about growing it, plant it at the back of your flower bed, where it is not so apt to be touched by ungloved hands and short-sleeved arms.

For pink-colored flowers, the bleeding-heart *(Dicentra spectabilis)* is most useful in spring, and can take some shade. So it is good for facing down a shrubbery planting or hedge. Oriental

DIVIDING PERENNIAL CLUMPS



poppies *(Papaver orientales)* give another source of shimmering pinks to choose from. Beware of the older orange and scarlet varieties since they do not combine well with plants of other colors. Both the poppies and the bleeding-heart die down after their blooming period is over, so plant them at the back of the flower bed, where their blank patch will not be noticed. Or plan to grow annuals on top of them. The dying back of these plants is natural—not a sign of failure—and a fresh crop of leaves will follow.

There is much pleasure to be had in growing the dainty and graceful columbine *(Aquilegia).* They are so easy to grow from seed, that it is well worthwhile to let a few end-of-the-season flowers form seedheads. The seed stalks can be cut when the fruits are nearly ripe and ready to split open. Just place them upside-down in a paper bag. After the seedheads crack open, the seed can be collected at the bottom of the bag, and sown in a shady, humusy seedbed. There is a wide spread of columbines to choose among—from the small, red and yellow-flowered native *(A. canadensis)* of eastern North America to all the handsome, long-spurred hybrids of Europe. The cultivar 'Oxford Blue' is a brilliant blue and well worth seeking out and planting in the herbaceous border. The columbines force easily to give attractive blooms on winter windowsills.

Different varieties of the tall, bearded iris, planted in separate patches, will carry the herbaceous border without any need of blooming companions. Or, they can be grown in separate and special iris beds. They need—even demand—full sun and well-drained soil to avoid damage from borers and subsequent rot.

Yet another pink or white spiky plant is the spiraea *(Astilbe).* This plant will take semi-shade, so has many uses. The graceful plumes of flowers are pretty in summer and the foliage is excellent throughout the season.

Veronica is one of the old reliables for the herbaceous border garden. *V. spicata* grows about a foot and a half tall and is topped in early summer by pretty spikes of blue, pink or white flowers. The blue-flowered form is the one most often used. *V. longifolia subsessilis* is a slightly larger plant with better looking foliage, larger flower spikes and a longer blooming period. There seem to be more blue-flowered plants than any other kind. But all these blues tend to mix well with other colors. Also, they tend to give depth to a flower border since they recede well into the background of a border planting.

midsummer choices

A good midsummer combination is plantain-lily *(Hosta* spp.*)* and daylily *(Hemerocallis* spp.*).* Both are large and varied plant groups, with a range of colors to choose from. There are splendid reds and yellows in the daylily and blues and white in the plantain-lily. Both are strong and vigorous growers. Another midsummer reliable is *Phlox.* The colors range from white to pink, and some have red centers on a white background. The important thing in growing phlox is never, never to let

continued



Primroses



Grape hyacinth



Bleeding heart

seedheads form, for the seed will come up like the old, magenta grandparent and then crowd out the select, modern variety.

Our native American asters and chrysanthemums from the orient wind up the flowering season. Both are really showy plants, and worth collecting. Asters come in a wide color range from white through pink and lavender to deep purple, and they are really lovely. They grow wild, of course, along our roadsides, so we tend to pass them by with little or no notice. But they certainly belong in our flower gardens, and should be grown more often. They can stand our climate, and are not demanding of special care.

Chrysanthemums, on the other hand, need lots of attention. They should be divided every year, so they really need a nursery or reserve garden to start them off in every spring. If spring-blooming biennials are grown in the herbaceous border, these must be yanked out when they finish blooming. And it is customary to put the new, young plants of chrysanthemums in their place. If there were no biennials, then space in the show garden must be set aside for patches of the chrysanthemums. The taller varieties will need staking, and all the new plants must be pinched back to make them bushy. Some varieties are only doubtfully hardy, and it is a safety precaution to dig a clump of each of this category, and carry them over winter in a cold-frame.

There are so many lovely perennials, that the list could go on and on and on. These are but a few of the more useful ones. Gardens are never finished and that can be both a joy and a sorrow. But perennial gardens, in particular, should be done with a notebook in hand. Then notations can be made each growing season of improvements to be carried out the following year. Keep records, too, of plants that do especially well and of plant combinations that are especially beautiful. This kind of gardening will keep you busy, but it can be very rewarding.

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Mary S. Green assisted the horticulturist at PHS in the '50s and was the Society's first horticultural librarian. She studied horticulture at the Pennsylvania School of Horticulture for Women at Ambler and botany at Radcliffe College of Harvard University. She has also done practical work in estate garden management. Green is now a garden consultant and free-lance journalist.



Perennial border includes astilbe (the red and cream colored flowers), white delphinium, veronica, *Allium giganteum* (large white heads), feverfew and *Chrysanthemum maximum*.

AREA PERENNIAL BLOOM CHART

	Time of bloom—Dependent on weather	Color	Character of Plant
Snowdrops *Galanthus nivalis*	February—March	White	Few inches high
Winter aconite *Eranthis hyemalis*	February—March	Yellow	Few inches high
Bloodroot *Singuinaria canadensis*	Late March—early May	White	Few inches high
Glory-of-the-snow *Chionodoxa luciliae*	Late March—early May	Blue	Few inches high
Jack-in-the-pulpit *Arisaema triphyllum*	April	Green	Spiky
Bleeding heart *Dicentra spectabilis*	Mid-April—late June	Pink and white	Bushy
Leopard's bane *Doronicum* spp.	May	Yellow	Round flowers
Siberia bugloss *Brunnera macrophylla*	May—June	Blue	Bushy
Columbine *Aquilegia* spp.	May—June	White, pink, red, blue, purple	Bushy
Poppy *Papaver* spp.	Mid-May—early June	Red, pink, white, orange	Round flowers
Iris spp.	Mid-May—June	White, pink, red brown, blue, purple	Spiky
Bugloss *Anchusa italica*	Mid-May—mid-July	Blue	Bushy
Spiraea spp.	Early June—early July	White, pink, red	Spiky
Delphinium spp.	June—early July	White, pink, blue, purple	Spiky
Gas plant *Dictamus albus*	June—July	White, pink	Spiky
Veronica spp.	June—July	Blue	Spiky
Daylily *Hemerocallis* spp.	June—July	Yellow, red, brown	Spiky
Phlox spp.	July—September	Pink, white, red	Round flower, clusters
Hosta spp.	August—September	Blue, white, purple	Spiky
Aster spp.	September—October	Blue, white, pink purple	Round flowers
Chrysanthemum spp.	September—November	White, pink, red, yellow, brown	Round flowers

Strange and Indelicate Flowers: *the Stapelieae*

by H. Peter Loewer

An orange sun forms one fiery bubble in a flat and deep blue sky. The only signs of movement on the vast horizon are the shimmering waves of heat as they rise in frantic whorls from the sea of sand that seems to stretch forever. And it is hot . . . dry and hot.

At first glance all seems to be lifeless and bare: just sand and stone enveloped in a deathly stillness. Then in the shady crook of a large rock I see a twisted bunch of thick, green, tapered stems all splotched with purple and hear the buzz of a lone fly. I look again and spy a vivid orange and purple flower. Flower? What kind of flower looks more like tooled and wrinkled leather tattooed with awesome color than the jewels that crown a normal plant with glory? And that fly; why the fly? Then too, the smell—ever so slight—just a whiff, a faint emanation of spoiled fruit or meat a bit too ripe.

Suddenly I see the fly that only buzzed before. It walks about the bright petals of the flower, crisscrossing the thickened ring that stands slightly above and center to those pleated petals, disappearing over the edge of the ring, down into a dark crevasse where it buzzes all the louder, like a bee with honey.

The buzzing stops. The fly appears again. Only now stuck to one leg is a bright yellow ball of pollen. The creature shakes its leg as though to drop the added load; thinks better of it and spirals up and around descending to another nearby flower.

It's quiet again. And what I've witnessed is the pollination of a blossom by a fly in a meadow of sand. For the desert is much too hot and barren for a honey bee; too dry and dusty for the typical flower of the field. But perfect for a plant that is only eclipsed in strangeness by the more exotic of the orchids—and some would argue that; perfect for the stapeliad.

Although the stems of the stapeliad family—and stems they mostly are for the leaves are tiny or miniscule—have never been the most exciting thing to hit the house plant world, the flowers are. Bizarre, unique, and indelicate, they always elicit response when displayed at flower shows and generate a chorus of "oooooo's" and "ahhhhhh's" when they accompany me on lectures.

"I'd call it a crochet flower," said one lady. "They don't even look real; a creation of the hook and needle, I'd say."

"A strange hook and needle," said another gentleman.

"But worth having in the collection," added a third member of the audience. "Could I have a cutting?"

Everyone wants a cutting. Then when all the guests have been provided with a bit of stem, and only then, do they all ask about the odor and the common name of carrion flower. It isn't bad, I explain. It only gets strong when you have a multitude of flowers in a closed room or your nose gets a bit too close to the blooms. "But," I add, "the beauty is worth the nasal assault."

how the flower sets seed

When a fly spots a typical stapeliad from the air, like his cousin the bee, he is attracted first by the colors of the petals and then the odor produced by the small glands that also manufacture the flower's nectar. Unlike the gaudy and flagrant colors of many flowers, colors made for a bee, the stapeliads tend to ochre, mauve, and purple tones—often with a dash of yellow—colors made for a fly.

Upon landing on the edge of the annulus, the fly heads for the honey but must wedge his body between the various appurtenances produced by the blossom. And in so doing and the ensuing struggle to leave the chamber of sweets, his legs touch the pollen and it sticks.

The fly quickly travels to another flower where the scenario is reversed. Pollen balls are trapped by the same horns and since the entire top of the gynostegium is sensitive, pollen tubes quickly form to carry the pollen cell to the ovary for fertilization and the ultimate setting of seed.

Eventually the developing seed pods burst and throw out the seeds, each with their umbrella of silky threads, to ride upon the winds until they alight on a favorable spot thence to sprout and produce new plants.

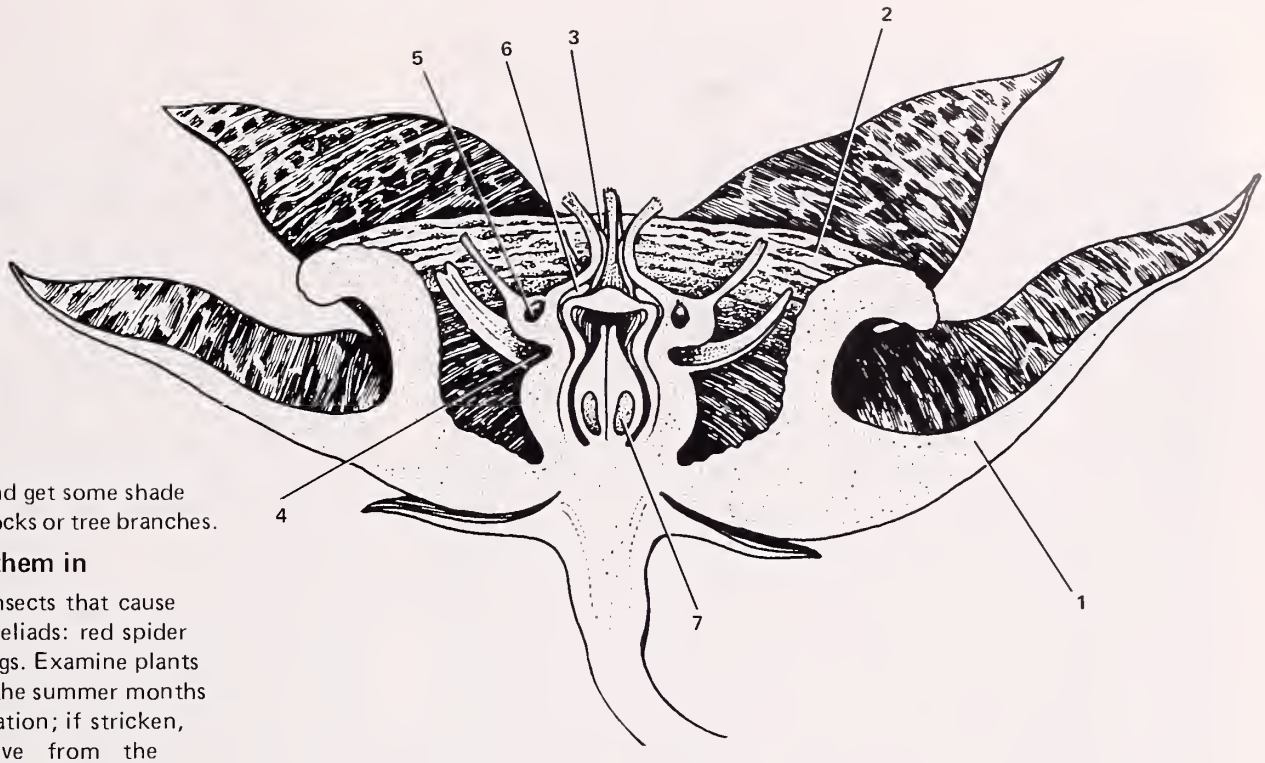
succulents by habit

The stapeliad family are all basically succulents, most from South Africa. So the primary rule of care is: provide adequate drainage. I use a soil mix of one-third sharp sand, one-third standard potting soil, and one-third well-rotted manure, with a liberal sprinkling of small charcoal chips or gravel.

While most will endure a temperature of some 40°F. they do not like such a chilly atmosphere. And if allowed to sit in wet soil when the thermometer falls that low, they will usually begin to rot. I generally withhold water from November to March, moving the plants up to my study where the temperature fluctuates between 50° to 70°F. depending on the outside winds and the use of the room.

When the days begin to lengthen, I move them back to the greenhouse and start to water. During the hot summer months, I often provide a thorough soaking every other day or so. The plants all have shallow cord-like roots and are quite at home in small clay pots. Since such pots dry quickly when warm, you must provide enough water.

Try to give some noon-time shade. In their native haunts, stapeliads creep



along the ground and get some shade from overhanging rocks or tree branches.

pests and doing them in

There are two insects that cause difficulty with stapeliads: red spider mites and mealy bugs. Examine plants every week during the summer months for a sign of infestation; if stricken, immediately remove from the company of other healthy plants.

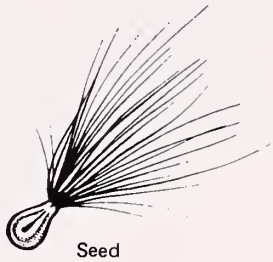
Red spiders are tiny but their feeding habits soon make themselves known with the dried spots that appear upon the stems and the quickly forming mats of tiny webs. I usually do not use any insecticides but instead spray the offending plant with jets of warm water, an anathema to the mites. If infestation is beyond control, then destroy the plant while taking clean stem cuttings for your collection.

Mealy bugs are recognized as tiny to middling dots of white, covered with a cottony mass. They like to hide in the cracks along the stems, especially in the joints. Cottony masses are also found on the edge of the pot's drain hole and even under the saucer. Beware, for these are terrible pests, and if on the stems are just as likely at home among the roots.

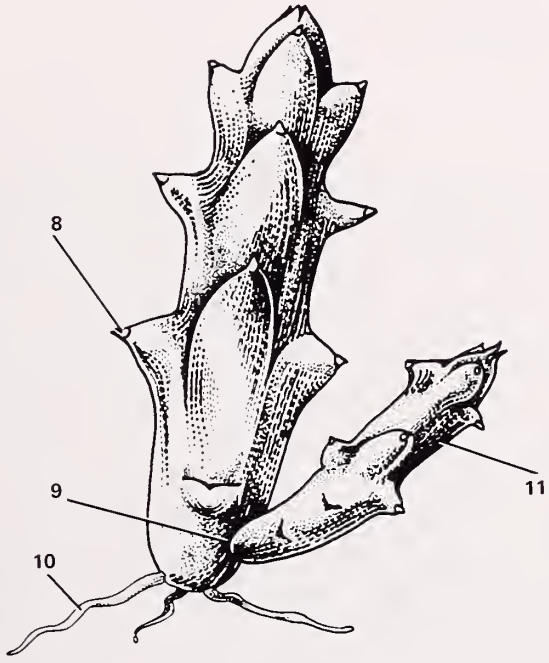
There is but one sure way to do them in: remove the plants from the soil. Pour the soil out into shallow metal trays and sterilize in a hot oven—185° F. 15 minutes. The ensuing smell of baking dirt will tell you who your true friends are, but the process works; the heat will kill fungus, insects, and even weed seeds without harming the beneficial bacteria.

Next, douse the plants including every root, in a dish of denatured alcohol, swirling them about for a few minutes, then rising in warm water. The alcohol will destroy the waxy coating on the bugs but will not harm the plant.

continued



Seed



drawing by author

A typical stapeliad flower, in this case *Stapelia variegata,* cut in half to show the major parts. To the right, a seed, showing the clear relationship to the milkweeds that we know in the United States.

1. Part of a petal
2. The annulus or interior petal with its typical fold
3. The top of the gynostegium, a column formed of both the male stamens and the female pistil and the ovary.
4. The glands that produce the nectar of the flower.
5. The waxy balls of pollen waiting to be picked up by a visiting fly.
6. The area where pollen is trapped for fertilization
7. The ovary with developing seed
8. The rudimentary leaf of the stapeliads
9. The stem node where the offshoots are joined
10. Roots
11. Offshoot

the Stapelieae
continued

Stapeliads have always been popular subjects for Victorian artists. This watercolor of *Stapelia pulvinata* was copied for a period scrapbook in the 1840's. The original drawing made in 1809, by Sydenham Edwards, appeared in Curtis's Botanical Magazine Vol. 1810. Edwards was a botanical artist in the employ of the magazine. I found this particular piece of art in an old used book store.



[1240]

STAPELIA PULVINATA. CUSHIONED STAPELIA.

Class and Order.

PENTANDRIA DIGYNIA.

Generic Character.

Nectar. duplici ſtellula tegente genitalia.

Specific Character and Synonyms.

STAPELIA *pulvinata ;* ramis reclinatis, corollis quinquefidis: laciniis ſubrotundis rugoſis acuminatis ciliatis, fundo elevato denſiſſime piloſo.
STAPELIA *pulvinata. Maſſon Stap. p.* 13. *t.* 13. *Willd. Sp. Pl.* 1279. *Martyn Mill. Dict. n.* 7.

This ſpecies is one of the moſt ſplendid in the genus, but the colours are not uſually ſo bright as in the ſpecimen from which our drawing was made, ſome years ago, at Mr. WOODFORD'S late garden at Vauxhall.

It was introduced by Mr. MASSON from the Cape, where it grows among buſhes, about Camies-Burg, and is called by the Dutch inhabitants the Arabiſche Roſe ; the ſenſe of ſmelling alone is however fully ſufficient to expel every idea of affinity with that fragrant genus.

Curtis's Botanical Magazine, Vol. 31, London, 1810

Stultitia hardyi in bloom. This species is a close relative of the stapeliads. My plant came from a cutting of the original plant collected in 1961 at Wyllie's Poort in the Transvaal and obtained through the services of the Cactus and Succulent Society of America.



Piaranthus ruschii makes a tiny statement compared to many others of the stapeliad family as the bloom is only 3/4 of an inch in diameter. It was discovered in South West Africa in 1936 and is a close relative of *P. foetidus*—a plant that truly deserves its name—but smells more of over-ripe fruit than something more noxious.



Stapelia pasadenenis, a hybrid of the large-flowered stapeliads found by Alain White and Boyd Sloane in their collection of plants at Pasadena, California, and named in honor of the city. The flower pictured is over six inches in diameter and, at the insistence of my wife, given a berth out-of-doors when in flower.



If you are overrun by mealy bugs then take cuttings and start again.

When buying plants from any nursery, no matter how fine its reputation, examine each new arrival for pests. The most careful supplier can be careless.

propagation with cuttings and seeds

Take cuttings of your plants in the late spring when the weather is on the warm side. The cutting is best removed from the joint of a parent stem then set aside for a few days until the cut or break is dry. Use pieces at least an inch long.

Push cuttings into a dish or pot of warm moist sand to a depth of one-half to one inch. Roots will appear in a few days. The fledgling plant can be moved to a permanent pot when roots are about an inch long.

Seeds are a fine way to start or expand a collection. Many of today's seed catalogs—especially the English and German succulent dealers—offer selections. The International Asclepiad Society maintains a seed bank for its members.

Try to secure fresh seed. I use one of the commercial "sow and grow" mixes in individual peat pots, set in plastic seed pans, covered with glass sheets, and placed on heating cables. When seedlings appear, raise the glass to provide needed ventilation and be sure to provide shade from the hot sun; the tiny plants are not too strong. Keep the medium moist and in about three months, the young plants can be moved to a three-inch pot.

for more information

If you decide to give these fascinating plants a try in your house plant garden, you will probably want to delve deeper into their mysteries.

My first advice is to join the International Asclepiad Society. (Asclepiad is the botanical name for the milkweed family to which the stapeliads belong.) They publish a fine and authoritative journal and maintain a seed bank and oversee seed exchanges. Mrs. J. Gutteridge is the membership secretary and her address is 3 Annes Walk, Caterham, Surrey CR3 5E1 England. The membership fee is about $10.00 a year but I'd write first.

The Cactus and Succulent Society publishes a journal six times a year and many articles feature the stapeliads and their relatives. In addition they have a yearly plant sale by mail and a grower can acquire a wide variety of plants. Dues are $10.00 a year. The address is Box 167, Reseda, California 91335.

Singers' Growing Things provide a catalog of plants for $1.00 and they carry a large variety of stapeliads. Their address is 17806 Plummer Street, Northridge, California 91325. Rainman Succulent Nursery at 20101 Hanson Road, Fort Bragg, California 95437, sells a fine 32-page booklet that shows 50 different flowers in full color. They also have a large variety of these plants for sale.

There are not too many books available. But among those published, the bible of the field is the three-volume set: *The Staplieae* by Alain White and Boyd L. Sloane (Abbey San Encino Press, Pasadena, 1933). If your interest continues to be piqued, you might find a copy in a used book store or from a botanical book specialist.

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Peter Loewer is a botanical artist and scientific illustrator who writes and illustrates his own books. He lives near the Upper Delaware River and also edits a small upstate New York newspaper. His book, *Growing and Decorating with Grasses* (Walker, 1977), is a June selection of the American Garden Guild Book Club.

High Yields in a Small Space: A Hydroponic Roof Garden

by Art Hutchison

Container gardening has become a widespread horticultural technique used by many city dwellers on their roofs and sundecks. Many articles have been written on the use of pots and tubs for annuals, and oftentimes vegetable gardens. After several years of growing annuals in containers, I decided to move into vegetable gardening. In order to supply a continuous flow of vegetables, however, I found that I would need an enormous quantity of pots. I thus decided to build one large box and care for it exactly as if it were a plot in a backyard except the plants would be grown hydroponically.

Many people think of hydroponic gardening as growing plants in nutrient fortified water. However, most hydoponic operations use an aggregate or soil mixture to anchor the plants and to hold water and nutrients. The aggregate provides little or no nutrients. Aggregates can be pebbles, vermiculite, peat or various combinations of these materials.

I started by making a 6 ft. x 8 ft. box out of ¾-in. plywood. Drainage holes were drilled every 6 in. to 8 in. All surfaces were then coated with a wood preservative (cuprinol) that is safe for horticultural use. Next, one inch strips were nailed to the inside bottom of the box and small pebbles were placed between the wooden strips to facilitate drainage. A fine mesh screen covered the rocks and was tacked to the wooden strips. This helped to prevent the loss of soil during heavy rains.

One difference between containers and backyard gardens is that heat is lost during cool spring and fall nights. To duplicate natural soil conditions, I placed a 20 ft. heating cable with a 72° thermostat on top of the screen. The screen dispersed the heat evenly over the soil surface. The artificial heating allowed me to start spring crops earlier than is recommended and also prevented the problems associated with tomatoes when night temperatures fall below 70°.

Articles on hydroponic gardening were helpful to me in determining the soil mixture and ways of providing a steady source of nutrients. I used an equal mix if vermiculite and peat moss for the planting aggregate. I did not, as some sources suggest, fortify this mixture with nutrients before planting.

In addition to the large box, I planted several vegetables in pots, which enabled me to evaluate the difference between the two techniques.

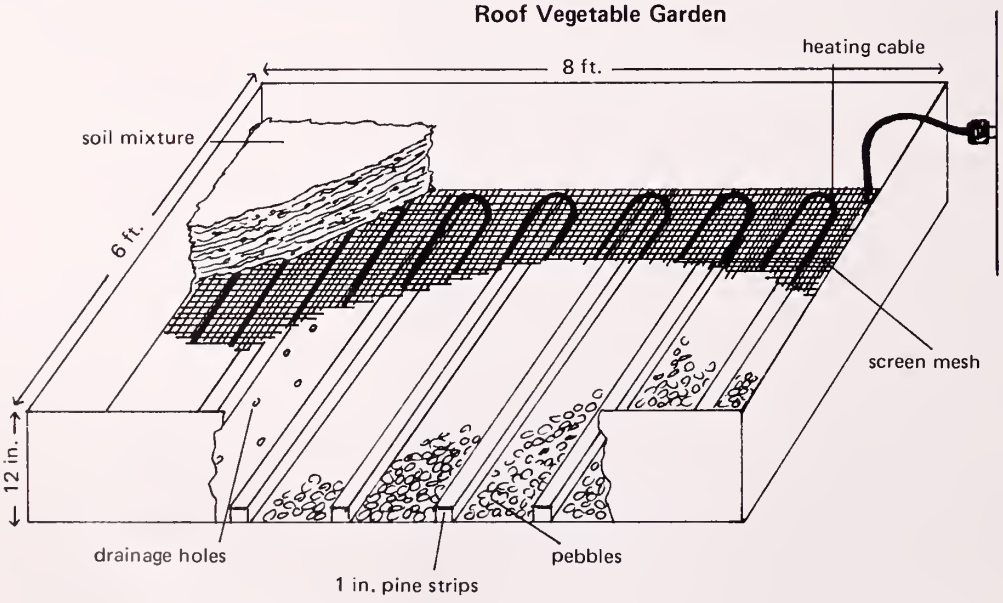
The next step was the vital planning of the garden on paper. With such limited space, I gave special attention to the varieties of vegetables and their dates of maturity. To produce the most vegetables, I planned a three crop season. The techniques for maximizing production were culled from books on small space gardening. Briefly these are:

- Intercropping – Plant fast growing varieties between slower growing vegetables, which spread out later.
- Catch cropping – Plant quick growing vegetables followed by slower ones.
- Successive cropping – Plant seasonal vegetables for spring, summer and fall harvests.

Using the hydroponic method also helped to save space. Since nutrients are continually added throughout the growing season, the roots do not have to spread as far in search of food. Therefore, I was able to cut in half the recommended plant spacing. Combining all these techniques, I devised charts indicating where each vegetable was to be planted, when to seed, when to transplant the vegetable to the garden, the harvest period, and the subsequent replacement crop.

I started all of the plants from seed. I was able to select varieties that have a short maturity and compact growth habits. Seeds for the early crops were started indoors, later season vegetables were put in flats outside. Starting vegetables from seed seemed almost a necessity, as nurseries do not always have plants available when you need them. Timing is very critical with a three-crop season in such a small space.

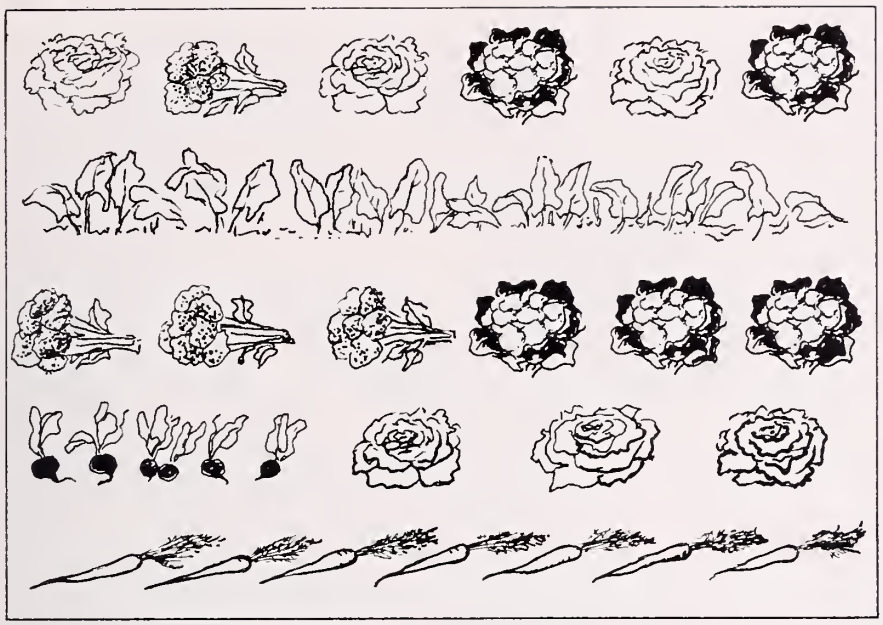
Roof Vegetable Garden



first transplants in by mid-March

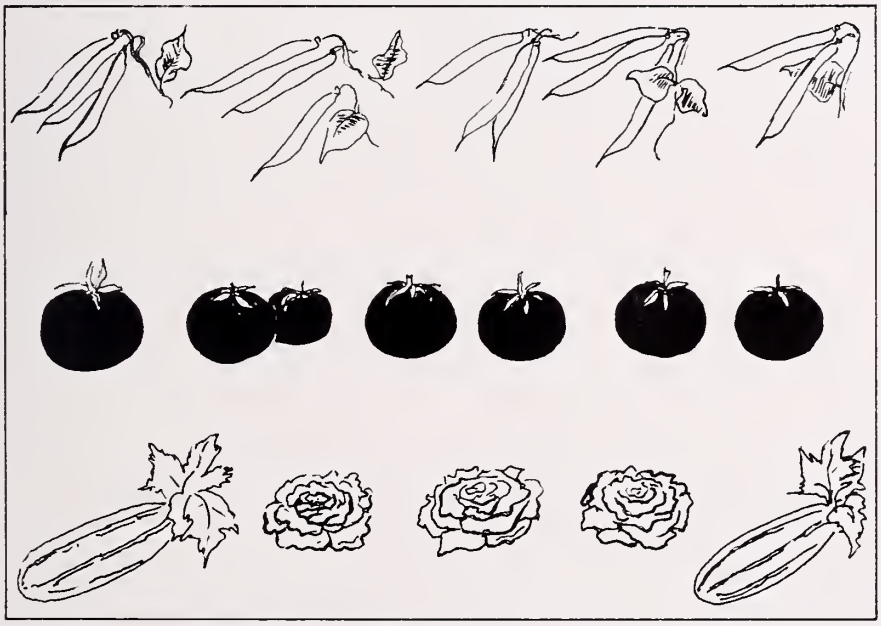
The first of the spring transplants were in the ground by March 17. As seen in the photographs, the first row was carrots (chosen for their low growth habit), followed by lettuce and radishes interplanted with the primary crop of broccoli. Spinach was planted between the row of broccoli and the third row of cauliflower. Spinach was used because of its low growth habit and quick maturity. By the time cauliflower and broccoli became large and the heads began to form, the lettuce, radishes and spinach were harvested.

Garden Layout for Spring (Fall garden similar)



Crop	Transplant (T) or Seed (s) Date	First Harvest Date
Carrots	March 23 (S)	June 1
Radishes	March 23 (S)	May 1
Lettuce	March 23 - April 8 (S)	May 10 - 30
Broccoli	March 23 (T)	May 26
Cauliflower	March 23 (T)	May 26
Spinach	March 23 (T)	May 10

Garden Layout for Summer



Crop	Transplant (T) or Seed (S) Date	First Harvest Date
Pole Beans	May 25 (S)	None
Tomatoes	May 10 (T)	July 2
Bush Squash	May 25 (S)	July 20
Lettuce	April 15 (S)	June 20

Toward the middle of May when the broccoli and cauliflower were two to three weeks from harvest, the tomato plants were placed between the last two rows formerly occuppied by the spinach. By the time the tomatoes had reached a foot and a half, the last of the spring crops had been harvested. Bush squash seeds were planted in front of the tomatoes to complete the summer crops. At no time has any space been left unplanted.

Throughout the summer, the tomatoes proved to be the banner crop. Each plant yielded 50 to 75 tomatoes before they were attacked by the fungus *Verticillium.* Meanwhile, the test tomatoes in the individual containers yielded fewer tomatoes and their quality was inferior.

During August, broccoli and cauliflower seeds were again started in flats and were later transplanted to the area between the tomatoes. Swiss chard and lettuce plants were placed throughout the garden when space became available. So began the fall crop. As in the spring, the heating cables extended the fall season by several weeks, allowing a gradual harvest of these vegetables.

problems

No garden is without problems. The first dilemma I faced was the application of fertilizer. I could find no book that set forth specific instructions on the appropriate rate of application. I had intended to mix my own fertilizer salts but ended up using "Miracle Grow" because of the scarcity in garden shops of all the necessary ingredients. At first I overfertilized the plants as indicated by the burnt broccoli leaves. I then underfertilized, which became evident with the first puny tomatoes. Gradually I was able to judge the proper amount by closely observing the plant's growth and leaf color.

The rate of fertilizer application appeared to be dependent on the sunlight, temperature and the frequency of drenching rains. These rains are beneficial because the unused fertilizer salts are purged from the soil. After such a rain, I would apply the full recommended strength fertilizer to

continued

High Yields
continued



1 The end of the spring crop. Included are new plantings of lettuce and radishes for quick crop before the summer crops grow.

2 Harvest of spring crop. Cauliflower and broccoli.

3 Late June and summer crop. Petunias in the foreground. Squash is in the front of the box, tomatoes in the rear.

1



2



3

restore nutrient levels. During the hot and dry periods, I water more frequently but use a one quarter strength application. The trick is to provide a continual flow of fertilizer to the plants. To ease the watering and fertilizing task, I attached to the hose a lawn sprayer with reservoir for nutrients to be fed into the hose.

Nitrogen leached out of the soil faster than the other salts. The lettuce grew more slowly than planned and was somewhat bitter and tough. The pole beans planted at the rear of the plot to run up a nylon trellis were a dismal failure. In the fall season, I began to apply nitrogen (in the form of pellets dissolved in water) separately to the leafy plants along with the "Miracle Grow." These crops improved greatly. Next year, I plan to use a fertilizer testing kit to better gauge the nutrient supply.

My container garden attracted the same influx of pests as does the backyard plot. The list of visitors included cabbage worms, tobacco hornworms, aphids, and white flies. Careful plant inspection, hand picking, and limited use of malathion controlled these invasions.

I am not discouraged but rather have learned from these adversities. I expect next year's garden will provide a bumper harvest because of this year's experiences. I plan to use more innovative techniques for the garden on my third floor sundeck. That will entail using an array of 8-in. pipes bracketed to the walls, planting them and pumping nutrients through. That, however, is another story for another time.

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Art Hutchison has been growing container gardens for several years. He combines his interest in photography with gardening to keep visual records of each year's plantings.



photos by author



A variety of textures, colors, smells and sound from the combination of wood, water, herbs and juniper provide a small and special atmosphere to a tiny garden corner.

A BUDGET BARREL OF ATMOSPHERE

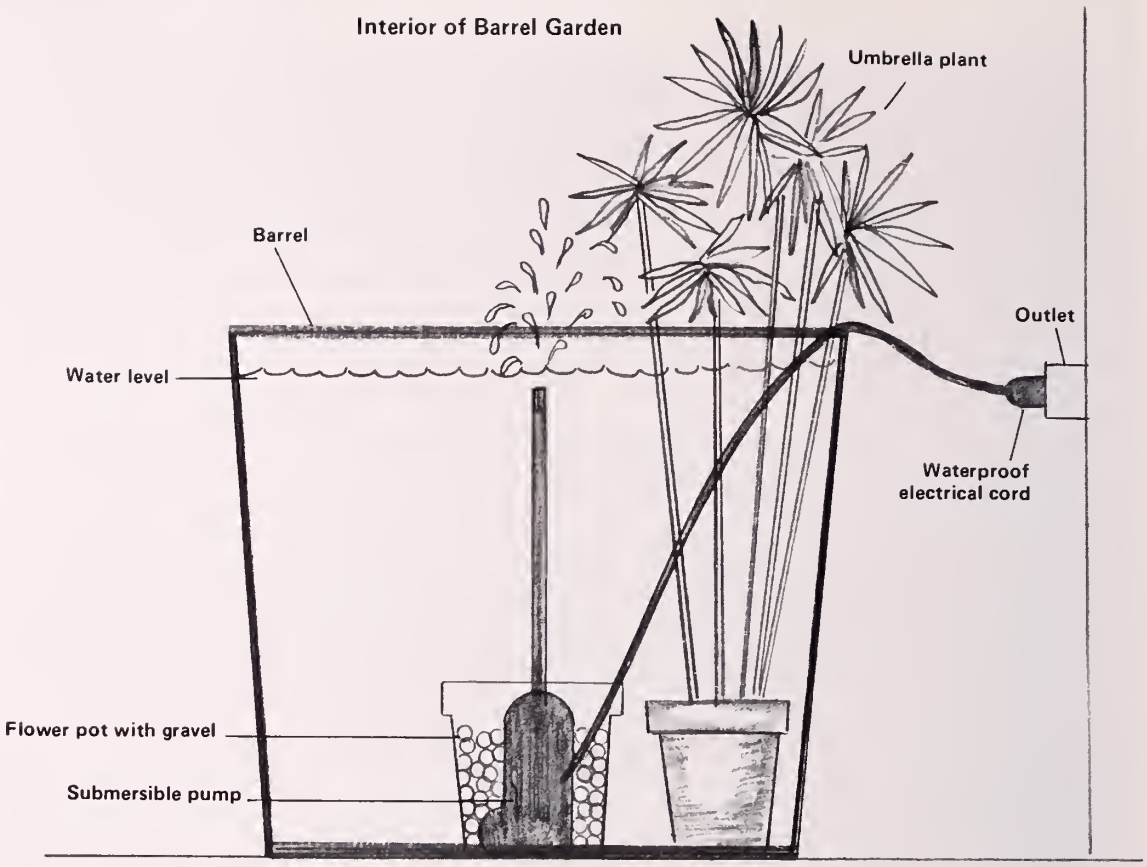
by Ed Lindemann

When we moved into our home four years ago the need for costly renovations inside the house left little in the budget for developing the garden. Fortunately we were able to move a great many plants with us from our previous garden. But, as anyone who has ever planned a garden knows, you need more than plants to complete the picture. I've always felt that next to plants, some type of water feature is the most

continued

A BUDGET BARREL OF ATMOSPHERE

continued



important element in a garden. The reflection, movement and sound of water bring a garden to life.

A pool or fountain were just not in our budget. I had noticed half barrels used as planters and thought they looked attractive. One day while I was in the garden of PHS staff member Charlotte Archer, a barrel fancier from way back, I noticed that she had some filled with water and aquatic plants. The idea of adding a submersible pump to create a self-contained fountain was simple to come by.

As luck would have it, my brother who was moving north from Texas said he had some halved whiskey barrels and that he would have them put on the moving van along with the rest of his belongings. Great! I would be getting the container for my fountain free thus allowing me to spend money on the pump without feeling too extravagant. What I had not counted on was that my brother's house would run several months over on its building completion date, and that along with his belongings my barrel went into storage. The problem wasn't that I was delayed several months in building my fountain, but in the fact that furniture in storage is kept under very dry conditions. When a barrel dries out the bottom and side pieces shrink. The day my barrel was delivered we gingerly lifted the rickety mass from the rear of a station wagon and set it in the driveway only to have it collapse into about two dozen pieces. Putting a half barrel back together is no easy task. It took lots of swearing, several hours of hammering and lots of perseverance. Once we had the barrel reassembled I immediately filled it with water and kept a hose running slowly for several days to keep the water filled to the top allowing the pieces to swell and eventually to become water tight.

I decided to place my barrel in a corner of the herb garden. I felt that the natural rustic wood would blend well with the various textures of the herb plants. This location also placed the barrel near a small terrace where it would be enjoyed and near a living room window through which the sound of the bubbling water is carried indoors.

The barrel was placed on a bed of coarse stone to allow for drainage. I used a carpenter's level to make sure that the rim was level. The small submersible pump came from a garden center and cost under $40. It sits in the bottom of the barrel in a large flower pot filled with gravel. The weight of the gravel keeps the pump from moving along the bottom of the barrel. A pot of *Cyperus alternifolius* (umbrella plant) moves from a saucer of water in the living room to the barrel for the summer. Goldfish and a few large snails from the pet shop provide additional movement and controls mosquitoes. A small amount of chemical used to clear up ponds also available from the pet shop is added early in the season and keeps the water clear all summer. The goldfish must come inside to winter in an aquarium.

My fountain has caused more comment from visitors than any other feature in the garden. The oil deliveryman plans to add one to his garden and studies it every time he comes by. The best comment came from a house painter who asked if it was hooked up to a natural spring. He was amazed to find that you don't have to have a constant water supply to have moving water.

I enjoy the barrel most when I wake up in the middle of the night and the quiet allows the sound of the bubbling water to drift up and in through my bedroom window. It is easy then to pretend that I'm miles from civilization camped near a babbling brook. Sleep quickly returns. My budget barrel of atmosphere has been a great investment.

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Ed Lindemann is PHS horticulturist and Flower Show designer.



photos by author

Night Blooming Cereus

Hylocereus undatus opening over a period of hours.







by Robert J. Salgado

Few plants are capable of more spectacular floral displays than a night-blooming cereus *(Hylocereus undatus)*. The large, sweet-smelling flowers of this climbing cactus, however, bloom for only a few hours. The white flowers open slowly at nightfall and have usually collapsed by morning. Multiple blooms are common. Our night-blooming cereus has had as many as 11 flowers opening on one night. Usually, we notice the blooms starting to open at dinnertime, but there have been times when we would have missed the whole show except for the distinctive smell

The plant's long stems start out as leaves. You can actually see the leaves in transition to stems, thickening in one dimension and narrowing in another.

that alerted us to look before we went to bed.

Blooming frequency and the number of blooms vary from plant to plant. Ours survived many years of benign neglect and has now won its place in our sunny, south-facing dining room. We started 10 years ago with a cutting from one plant and a small piece of a mature plant that rarely bloomed. Five years later ours was blooming profusely.

In its natural jungle habitat, *Hylocereus undatus* is a climbing plant with aerial roots that can cling to rocks or the bark of trees. In our Pennsylvania home, it is a sprawling, untidy plant that has to be supported or it will fall over. Taking it out to wash it down in good weather is a family project—a strong back or two to carry the pot and an understanding gardener to ease the top-heavy foliage through the door. Continuous pruning of the foliage and

continued



Hylocereus undatus

an annual root pruning have kept our night-blooming cereus within bounds. Its wavy green leaves and its size make it an impressive plant, even without blooms.

The growth patterns of *Hylocereus undatus* are strange and fascinating to watch, at least to those unfamiliar with cacti. The plant's long stems start out as leaves. You can actually see the leaves in transition to stems, thickening in one dimension and narrowing in another.

Leaf buds sprout from notches in the plant's wavy leaves. As the new leaves grow, the older ones thicken into stems. Flower buds also sprout from leaf notches, but are discernibly different from the very beginning. Flower buds are pointed, unlike the multi-lobed leaf buds. Some buds are incredibly tenacious, while others can be brushed off by a cat squeezing by on a windowsill.

These tiny buds grow into flowers easily 7 in. across, hanging by a tubular attachment to the leaves. If the flowers are pollinated, an edible red fruit will develop. We have always removed the flowers after they collapsed, foreclosing any chance of fruit.

Hylocereus undatus can live outside during the summer and ours did for



H. undatus in daylight

awhile, but then you run a good chance that it will bloom without being seen. You can tell when a flower is going to open by the size of enlarged bud, but only a few hours ahead of time. In the morning, it is hard to tell whether a bud is going to open that night or the next.

Our night-blooming cereus grows in an unglazed clay pot and does well in it. The soil is renewed every year when the plant is root pruned. During its first five years with us, the plant was kept in a small pot and received minimal care. The root pruning became necessary when it matured, even with a larger pot. While it is simple to propagate *Hylocereus undatus* through cuttings, I recently saw small plants for sale at 99 cents each (at Russell Gardens in Churchville).

During the winter, our night-blooming cereus is watered sparingly and it gets no fertilizer from November to February. Its blooming season starts in early summer and then it can count on daily watering with the addition of a water-soluble fertilizer once a week.

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Robert Salgado is a photographer and writer. He shares his wife's horticultural interests, which include a substantial indoor garden as well as a summer herb garden. Otherwise he spends a lot of his spare time fighting the honeysyckle that has spread over three acres.



H. undatus plant in bloom

Tender Shrubs in a Tough Climate: *Camellias and Others*

by Howard H. Roberts



Eighteen years ago we ordered our first camellia plant, a two-year-old *C. japonica* 'Jordan's Pride' from a nursery in California. At that time young camellias in containers were scarce at local nurseries, and they had to be ordered by mail. When the shrub arrived in the spring, we planted it on the west side of our house close to a stockade fence that protected it from the north wind. It stood only slightly higher than the pachysandra that surrounded it. When we moved away eight years later, it was at least 5 ft. tall, well branched and heavily flowering. New owners enjoyed its evergreen foliage and abundance of variegated pink flowers for several more years until the abnormally cold winter of 1976 ended its career.

One successful experience with a semihardy shrub hardly makes the owner an authority on the subject. Yet we think there actually are a few advantages in being a rank amateur: you're willing to experiment with plants that experts would consider poor risks; you aren't overly discouraged by the number of losses; and when something good happens, there's a special joy in beginners' luck. That leads us to our oldest camellia, *C. japonica* 'Chandleri Elegans' which we planted here 10 years ago.

When it came time to move into our present house in the fall of 1970, we were confronted by wall-to-wall yews, which filled the dooryard area like so many overstuffed sofas. A timely newspaper article on the value of broad-leaved evergreens was all it took to trigger a replacement plan. There's no need to go into the throes of removing long established yew bushes other than to say that the wood is like iron, the roots like rock, and there must have been an easier way . . . dynamite perhaps. Since our front dooryard is on the west side of the house and sheltered from the north wind by a garage wall, we felt that when spring arrived it would be worthwhile to experiment with specimens of doubtful hardiness, such as camellias and southern daphnes, for example. Though the article recommended a north or northwest exposure to avoid winter sun, ours happened to be a south to southwest exposure with protection from early morning sun.

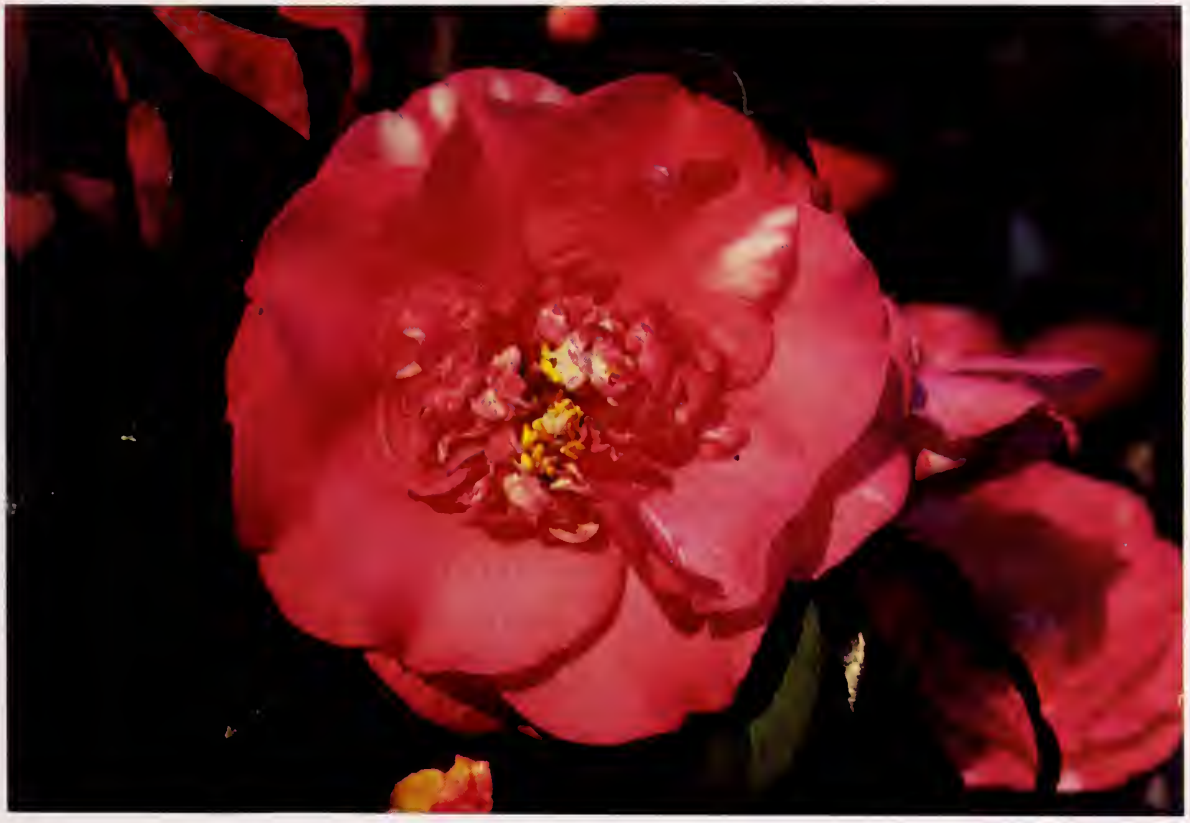
Our second purchase of camellias was again from California—two 24-in. plants of *C. japonica* 'Chandleri Elegans' and 'Bernice Boddy.' According to the same inspirational newspaper article, these were hardier varieties than most, especially the latter. This time we ordered from Nuccio's Nurseries of Altadena, California, one of the leading camellia growers in the country. The recommended method of shipment was in containers by Greyhound bus. That necessitated our driving to King of Prussia about four days after the shipping date to pick up a sturdy crate, several times the size of its contents. The plants, to say the least, were in superb condition, but for economy's sake we've had future shipments mailed bare root, with satisfactory results. Soon after the two camellias from California arrived, we brought back two 36-in. plants of full double, pale pink 'Eleanor Hagood' from southern Delaware to flank the front door, with the optimistic thought that, having weathered a few winters outdoors under tall pines in Delaware, they would no doubt outlive the west coast imports. 'Berenice Boddy,' against the west wall of the house, grew reasonably well for the next four years, intermittently blooming in the spring. Now, after a surprisingly mild winter, it has ended up as a shadow of its former self.

continued



photos by author

Camellia japonica 'Chandleri Elegans' in bloom with the primroses. The camellia is 7 ft. high. The primroses, which are replenished each spring with seedlings started the year before, were about 10 days behind the camellias last spring when these photos were taken.



Tender Shrubs continued

Because it had to be pruned so drastically, we moved it to an inconspicuous spot nicknamed "Last Chance" where it shows some genuine signs of making a comeback. 'Chandleri Elegans' stands against a south wall where during the summer it gets partial shade most of the day and full sun for about two hours at midday; it now stands over seven feet tall and displays more than 140 buds. One key branch died after the winter of 1978. The void has only partially filled out since then; however, the plant still ranks as our number one shrub. The pair of 'Eleanor Hagood' from Delaware bloomed the year after planting and died the following spring. They were replaced with two variegated, semi-double 'Adolphe Audusson' from California, which met the same fate. We didn't attempt camellias a third time in that location, but replaced them with the small leaved rhododendron 'Windbeam,' which is hardy but, as we learned the hard way, needs protection from the weight of snow and ice.

daphne

During the first winter we spent in this house we kept a *Daphne odora* indoors. A friend had brought it up from the south, and all reports indicated that it would not survive outdoors in this climate. Most reference books rate its hardiness as 7, suitable possibly for southern Maryland and Delaware, but not for any part of Pennsylvania. After five months in the house, it looked so scrawny and leafless that there seemed to be nothing to lose by planting it outside. It went next to 'Chandleri Elegans' by the south wall where it has stayed ever since, now having attained a height and breadth of about three feet. In early spring its strong lemon fragrance fills the area. We found that its cuttings rooted easily in plastic pots of damp vermiculite capped with inverted glass jars to retain the moisture. When sufficiently rooted, we set several of them outside in varying shelters and exposures. Even those that get the full sweep of the north wind have thrived through severe winters without special protection. Three of them bloomed profusely last spring. *Daphne retusa,* purportedly hardier than *D. odora,* has not survived a single winter outdoors for us, though we have tried several times, nor has *D. collina; D blagayana* survived one winter without flowering and died back almost to ground level during the past winter. We still haven't abandoned the idea of establishing more than one evergreen variety of daphne.

Today we can list a few more survivors in the *Camellia japonica* group. Red, anemone-shaped 'Derbyana,' which came from Washington, D.C. as a rooted cutting five years ago, has wintered against our west wall for the past two years and appears healthy,

There's no need to go into the throes of removing long established yew bushes other than to say that the wood is like iron, the roots like rock, and there must have been an easier way . . . dynamite perhaps.

but has only bloomed for us the spring before we set it outside. 'Ragland White Supreme' has weathered the past two winters with limited success; though it flowered two successive years, it suffered considerable winterkill in 1978, and it is debatable whether we will choose to keep it in its highly visible location. 'Guilio Nuccio,' a popular scarlet variety with prominent yellow stamens, and 'Elegans Supreme,' a soft pink specimen with fimbriated petals, have been moved to Last Chance where they are making their last ditch effort at survival. Scarlet 'Colonel Firey' has spent the past winter outdoors, and, though a young plant, sports a number of well-shaped scarlet flowers. Double white 'Purity' has buds and three or four leaves at the tip of each spindly bare branch; it can hardly be considered decorative in its present state. We have successfully grown the beautiful, full double, white 'Nuccio's Gem' and the striking, variegated 'Emperor Wilhelm' by moving them indoors in October, for we have been advised that these are poor risks for wintering outside in Pennsylvania.

For winter protection, we usually surround zones 6 and 7 shrubs with chicken wire and pack the area about the trunks and lower branches with oak and beech leaves to a depth of at least a foot. This mulch helps retain moisture and serves as an insulation and wind break; we are convinced it has contributed to the survival of more than a few of our shrubs.

The fact that container grown camellias are now available in many varieties at local nurseries cannot be entirely for the sake of the greenhouse and cold porch trade. For anyone who has a sheltered spot where exposure to north wind and a full day of sunlight are avoidable, we think it's worth the gamble to plant a *Camellia japonica.* Try a variety that is rated among the hardier camellias and a late enough bloomer so that the buds won't begin to open before the last freeze. A few varieties frequently listed as good candidates are 'Kumasaka' (red), 'Chandleri Elegans' (pink with white), 'Berenice Boddy' (pink, single), 'Ville de Nantes' (variegated), and 'Blood of China' (red). If your first camellia doesn't make it, don't give up; sooner or later you'll be in for a happy surprise.

Sources for Camellias

Specialists

Nuccio's Nurseries
3555 Chaney Trail
Altadena, CA 91001
(213) 794-3383

Orinda Nursery
Bridgeville, DE 19933
(302) 337-7835

General Suppliers

Carroll Gardens
P.O. Box 310
44 E. Main St.
Westminster, MD 21157
(301) 848-5422

Rose Valley Nurseries, Inc.
684 S. New Middletown Rd.
Media, PA 19063
(215) 872-7206

J. Franklin Styer
Route 1
Concordville, PA 19331
(215) 459-4040

Waterloo Gardens
Devon Blvd. & Lancaster Ave.
Devon, PA 19333
(215) 293-0800

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Howard H. Roberts and his wife Joan are charter members of the Pennsylvania Camellia Society. The Roberts' enjoy gardening with broad-leaved evergreens at their home in Rosemont.

A Succession of Fragrance

by Adelaide C. Rackemann

Every gardener tries to have a succession of bloom in the garden—something in bloom at every season. In my own case, the year begins with *Eranthis* (winter aconite) in February and ends with *Helleborus niger* (Christmas rose. See Growing Interests on page 33.) But even more intriguing—at least in my book—is a succession of sweet smells. It is surprisingly easy to achieve.

Although I discovered this quite by accident, I am now planting with an eye—or a nose—to fragrance. So in our woods—a wild, almost untouched section of our three acres—*Lonicera fragrantissima* is in full flower by late February or early March. The earliest of the bush honeysuckles to bloom, this native of China wafts its delicate perfume a considerable distance, grows nicely in partial shade and is a semi-evergreen. It has red berries, much sought after by the birds, so this early honeysuckle bush serves an additional function in the garden.

A member of the heath family, called mayflower by the Pilgrims, who found it in abundance around Plymouth, trailing arbutus has been so widely picked, it is now an endangered plant.

It is not a prettily shaped shrub, unfortunately, but may be trimmed so it is less ungainly. Flowers of *Lonicera fragrantissima* are borne on the previous year's growth, however, so one should not prune too heavily. Left unpruned, it may grow to six feet or more. It can be easily transplanted, too, and I have tried to place it where, without intruding on the formal beds, it may be enjoyed not just in the woods but where the people are, too.

A more attractive small shrub is winter daphne, a plant originally from Japan, whose foliage enhances any garden, at any time of year. My own daphne is *Daphne odora* 'Marginata' with glossy, three-inch evergreen leaves edged with white. Planted next to the large photinia, with its reddish stems and leaves, the daphne helps screen the raised concrete base of our greenhouse. But even more important (from the standpoint of fragrance) are its small pinkish rose flowers, enriching the air during the month of March. It is relatively easy to take cuttings from daphne, too, as I found out one winter when an ice storm broke off a small branch. Rooting pieces of it, I now have three winter daphnes growing together. This is a plant that requires no special care, not even fertilizing. During the summer drought, I don't even water it. It receives indirect light most of the day, but strong late afternoon sun. Still this delightful plant thrives and the small daphne blossoms last several weeks.

Luckily, when the daphne flowers are gone, *Viburnum carlesii,* with its spicy assertiveness, takes over. We purposely planted three large carlesiis (sometimes called mayflower viburnum) near our kitchen door. On early spring mornings, as we sit at our breakfast table, the powerful perfume drifts into the room through the slightly opened door.

Although according to Donald Wyman in *Wyman's Garden Encyclopedia* (Macmillian, 1971) this species of viburnum is susceptible to a graft blight disease that can quickly kill even a well-established shrub, our own carlesii are still healthy (despite dry summers), subject only to the whim of our two donkeys. When unattended, Rex and Gingerbred *[sic]* have been known to nibble both the pale pink flowers and small branches. I do water and occasionally fertilize the *Viburnum carlesii*—with donkey manure.

Even while the viburnum's pungency still fills the air, the lilacs suddenly open to delight us. Our own lilacs are the common *Syringa vulgaris,* brought to this land by the 17th century settlers. How wise they were to have brought them. In early May, the flowers nod their purple heads in the wind, make me wish the month of May would last forever, that I might bury my nose deep in the clusters of flowers—and simply stay there.

When we moved to our present house almost 20 years ago, there was a huge lilac in the middle of a shaded terrace behind the kitchen, overwhelmed by spruce and oak trees. It did not bloom, and after two years of disappointment, we dug it up, only to find that it was not just one shrub any longer, but many shrubs. We gave some away, but transplanted many small lilacs, making sure they all had sun. While they are tall and sometimes spindly, we have them judiciously located throughout our property, some lining the entrance as a hedge, others inconscpicuously placed among other shrubs, such as vitex and wigelia, but where we can always smell them during their all too brief blooming period.

Occasionally the leaves of lilacs whiten with fungus in late summer. Otherwise, these charming plants have no problems. They are tough. Despite their unprepossessing appearance at other times, lilacs in bloom add such pleasure to our lives they are well worth having.

By the end of April, so many flowers come into bloom and the earth itself is so rich and full of sweetness, there is a general blending of delicious smells. We have our hyacinths and nar-

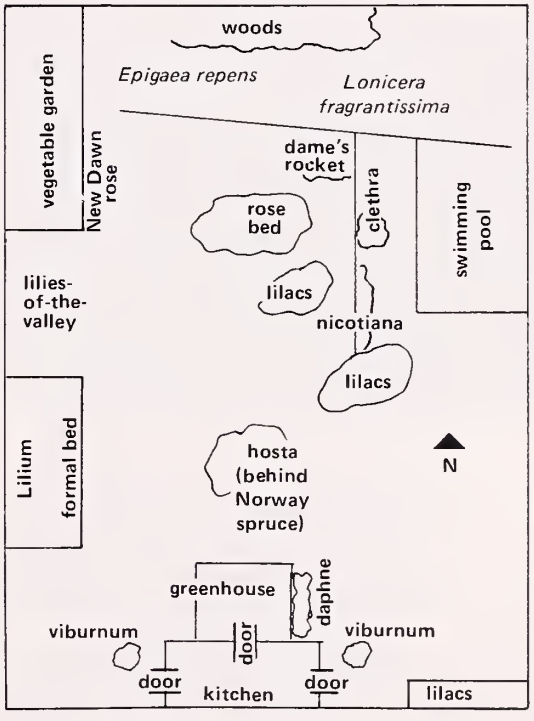




photo by Pamela Harper

Epigaea repens



photo by Francis Rackemann

New Dawn rose

Order of bloom for fragrance:

Lonicera fragrantissima	-	late February, early March to mid-March
Daphne odora 'Marginata'	-	early March through April
Viburnum carlesii	-	late April through May
Syringa vulgaris	-	late April to early May, through most of May
Epigaea repens	-	mid-April
Hesperis matronalis	-	late April, early May through June
Convallaria majalis	-	May
Roses	-	late May through entire growing season
Lilium varieties	-	June, July and August
Clethra paniculata	-	July through August
Hosta plantaginea	-	late August and September

cissus blooming in the formal beds, but I urge anyone who has room—and the right conditions—for a wildflower garden to plant *Epigaea repens* (trailing arbutus). This tiny, delicate flower is difficult to grow, thrives in pine woods and poor, acid soil. A member of the heath family, called mayflower by the Pilgrims, who found it in abundance around Plymouth, trailing arbutus has been so widely picked, it is now an endangered plant. Although I do not grow it in my own garden, I often walk into the adjoining woods in mid-April to smell it, bending down and lifting the leathery evergreen leaves that creep along the ground, to find the little pink flowers.

Hesperis matronalis (dame's rocket, or sweet rocket) is a much hardier wildflower to grow, lending itself nicely to casual planting. I have this tall member of the mustard family growing among ferns and lungwort and bergamot. Tall and arresting with its loose raceme of flowers, white, pink, magenta or lavender in color, this biennial makes a pleasant addition. Introduced from Europe, it has taken over much of the woods—including my own—in the Eastern United States. Its fragrance is spicy, reminiscent of carnations.

Lily-of-the-valley is a must in everyone's spring garden. *Convallaria majalis* is hardy, can grow undisturbed in partial shade, thrives planted under pine trees in my own yard, and can be a satisfactory groundcover when not in bloom, to the end of the summer.

Lily-of-the-valley grows in an informal border behind our kitchen, close enough for us to enjoy it in May. I frequently pick the small stems with their small, white, waxy bells. They emit a surprisingly strong scent for their size. A perennial, it spreads rather rapidly.

Roses, of course, are a chapter in themselves. Most of our hybrid teas are sweet-smelling. My favorite climbing rose, however, is 'New Dawn,' with its shell pink flowers that first appear in mid-May and keep on throughout the summer and early fall. Its subtle freshness sets it apart from the stronger scent of other roses. New Dawn is planted over the gate to our vegetable garden, a cascade of glossy dark green leaves and delicious pale flowers. A healthy, hardy climber, it is almost untroubled by the usual ailments of roses—including black-spot.

Such Lilium varieties as regale and black dragon (smelling like vanilla) offer pleasant odors in my formal garden, and each year I plant nicotiana in one or more flower beds. But by late July, and lasting through August, another small shrub adds fragrance. This is *Clethra paniculata,* or sweet pepperbush, with spikes of small white flowers. Planted behind my perennial border by the swimming pool, it receives sun most of the day. Except for occasional watering, it needs no attention. The leaves turn a pleasant yellow in October.

The last of my fragrant perennials—if we omit chrysanthemums—is *Hosta plantaginea,* a plantain lily that blooms in September. From three, dry, unpromising roots planted the previous year came three large clumps. Large, light green, rounded leaves set off the white flowers whose scent suggests orange blossoms. The clumps may soon be divided and planted in my perennial bed, but right now these handsome hostas are growing in semi-shade with a background of Norway spruce.

So these are some of the plants I have chosen to heighten the olfactory interest of my own garden, all easy to grow. While the list is hardly exhaustive, even these few plants provide an almost unending succession of sweetness.

●

Adelaide Rackemann serves on the board of the Horticultural Society of Maryland and the Cylburn Wildflower Preserve and Garden Center in Baltimore. She is a graduate of Wellesley College and has an MS from Columbia University in library science.

helleborus niger and h. orientalis

Our first hellebore was presented to us about nine years ago among a selection of other garden treasures. The selection was a present from an experienced gardener to one who was just beginning. So little did I know in those days that the plants had to remain in their flat until I had checked their vital statistics in my only gardening reference —*Wyman's Gardening Encylopedia* (Donald Wyman, Macmillan, 1971). As it turned out all the plants were shade lovers, and I put them in a bed under an old ash tree.

Early the following March I was delighted to find the hellebore producing large white flowers with a mass of yellow stamens. Each succeeding year the plant put on a better show, and I decided to move it nearer the front door so we could enjoy it from the dining room window. This time I didn't check back with Wyman and was horrified to read later, by chance in a gardening magazine, that hellebores hate to be moved. It was a long wait until spring but my hellebore bloomed well in its new location. As an added bonus I found several healthy seedlings in the original location under the ash tree.

Searching for information on hellebores can only lead to confusion, and you will probably end up wondering whether you have *Helleborus niger,* the Christmas-rose or *H. orientalis,* the Lenten-rose. To determine your species, study the flowers—are they borne several to a stalk *(H. orientalis)* or singly *(H. niger).* The Christmas-rose may bloom any time from late fall through March. The Lenten-rose usually blooms in early spring. Last year our Christmas-rose bloomed on March 30. This year it will probably be a different story.

If you have a friend with a hellebore ask for a division immediately after it has bloomed, in August or early September. I would suggest planting your division in a shaded location in rich humusy soil. L. Wilbur Zimmerman, until recently chairman of the PHS Council, tells me, however, that he has planted hellebores in both dappled shade and in full sun. Those in full sun have increased more rapidly than those in shade. Which just goes to show—there are no firm rules in the art of horticulture.

If you can't get hold of a division you might secure seeds although it will



photo by G. Hempfler

be several years before you get blooms. My three-year-old volunteers show no signs of being ready to produce flowers. The flowers on *H. niger* are white with a faint tinge of pink/purple. *H. orientalis* has a range of colors from white through pink to purple. While you wait for your hellebores to bloom take a trip to Winterthur this March and find your way to the "Hellebore Walk"—it's one of my favorite spring sights.

Jane G. Pepper

●

Jane G. Pepper is the executive director of PHS.

tectaria cicutaria

Amidst the lush growth of the Morris Arboretum fernery, I was horrified to see a large, handsome fern covered with what I thought were bugs. My guide was quick to explain that the "bugs" were in fact buds (also called bulbils, bulblets, or plantlets). Intrigued by my first encounter with tectaria, I soon purchased a plant and from that one pot I now have pots and pots of tectaria, thanks in large measure to the ease of propagating by buds. The buds will fall by themselves or may be picked off and lightly pressed into potting soil. I frequently find tectaria sprouting in other nearby fern pots, where if unchecked it will often take over the pot. Buds may appear on both upper and lower sides of the fronds, and bud bearing fronds may also bear spore cases. Sometimes the buds sprout while still on the "mother" frond, similar to the habit of the piggy-back plant.

The plant has an upright shape, with gracefully arching fronds. It seems to be less fussy about light and moisture requirements than many ferns. My handsomest tectaria is in a 6-in. hanging basket and was produced by peppering the pot soil surface with buds from other mature plants. (I would have liked to provide a photograph of this particular plant, but an unexpectedly extended summer vacation caused my tectarias, as well as many other plants, to suffer from lack of routine watering. My tectarias are making a good comeback now, but, as this photograph shows, they have not yet reached their full, hearty growth.)

The bright green color of the coarsely lobed fronds and their gently arching form, combined with the fun of sprouting buds and ease of cultivation, make tectaria a pleasing and interesting fern to grow.

Sandra Myers

●



photo by author

Sandra Myers is the cataloger at the PHS Library. An admirer of Victorian domestic architecture, Sandra is especially interested in Victorian window and parlor gardening, and has written on this subject for the Philadelphia Chapter of the Victorian Society. For the past ten years she has enjoyed growing an increasing variety of house plants, thereby perpetuating Victorian "green clutter" in her home.

LETTERS

We are always pleased to hear from our readers. We were especially pleased to receive a long letter from John Wister, the 93-year-old dean of horticulturists. Dr. Wister is known throughout the world for his substantial contributions to horticulture. He is still a member of some 50 horticultural institutions, about 30 scientific, civic and conservation organizations and a member of outdoor clubs. (See Green Scene, *March '75.) He has served on the PHS Executive Council and was secretary of the Society from 1928 to 1951. We've immodestly reprinted part of Dr. Wister's letter.*

Editor

Dear Editor,

I've been meaning to write to you. I've liked the *Green Scene* from the beginning. There has always been something in it to interest me and that is more than I can say about any other horticultural publication. But this last issue (September) was a knockout. *Everything* in it interested me. "The Autumn Garden" was particularly good and the "Case for the Wardian Case" and then the "Indoor Pools" and "Deck the Halls," even though artistic arrangements are anathema to me. Richardson Wright [past editor of *House & Garden* and author of several books] said when arrangements "come in the door horticulture jumps out the window."

And then the piece about the bizarre plant names ["If a Rose is a Rose is a Rose, What's Velvetwort?"] and the hamamaelis and the moss garden and the tissue culture (which I still don't believe though I've heard it explained time after time in the Plant Propagator's Society). Do you go to their meetings? You should, you must, they're the best of the horticultural meetings.

Of course I think growing azaleas from seed is easy. And I liked the Pine Barrens and the stone mulch pieces.

How does the Plant Finder work out? You know, of course, that the Rhododendron Society and the Rock Garden Society offer seeds of rarities. . .

John C. Wister
Swarthmore, Pa.

Dr. Wister raises a good question about "Plant Finders." We don't know how people are faring with their requests. Let us hear some of your success stories. And keep sending requests for the hard to find plants.

Dear Editor:

M. M. Brubaker's article in the July, 1980 *Green Scene* entitled "Chemicals for the Concerned Gardener" is, I think, the clearest and most helpful piece on garden pests and their control that I have read. I particularly liked the way in which he used the words organic and chemical.

I would add the LD-50s,* as they are generally given, and, I believe, as Brubaker lists them, are the figures for the technical 100% chemicals. Formulations of any one pesticide may vary widely in the hazard to human beings. A 75% wettable powder would contain 75 times the amount of the 100% active chemical as a 1% dust. In other words, the LD-50s listed do not apply to the commercial materials that we use. This explains why you may have to get a permit to buy a 75W, but the same pesticide as a dust might be so much safer that a permit would not be required.

But, read the label carefully. Perhaps, each kind of coffee and salt should have to have EPA approval with caution labels on each package.

Henry W. Ridgway
Mickleton, NJ

Henry W. Ridgway recently retired as editor of the Geiger Newsletter, *a publication highly regarded among horticulturists. We look forward to publishing some of his articles in the future, if we can lure him away from what looks like a very active retirement schedule.*

*The LD-50 is the lowest amount of a toxic substance (in mg/kilo of body weight) needed in a single dose to kill 50% of the rats in a given test. For example, it takes 50-60 mg/kilo of body weight of nictotine to kill 50% of the rats in a study, whereas it took more than 15,000 mg/kilo of body weight of Captan to kill 50% of the rats in a study.

the plant finder — A free service for *Green Scene* readers



If you can't locate a much wanted plant send your name and address (include zip), the botanical and common name of the plant to Plant Finder, Green Scene, PHS, 325 Walnut St., Philadelphia, PA 19106. People who have the plants or seeds you want will contact you to make arrangements about selling or giving them away, mailing, etc.

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Hardy Cyclamen (as seen in *The Green Scene,* Nov., Dec. 1978.)

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Astilbe sp. Perennials for Pleasure on page 12.



the green scene

Laurel Hill — Forerunner of the 19th Century Garden Cemetery Movement. See page 18.

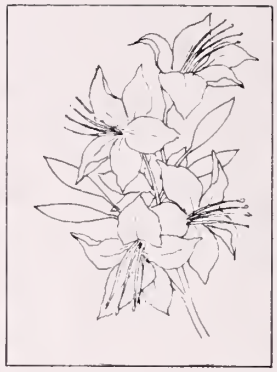
HORTICULTURE IN THE DELAWARE VALLEY
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THE
green scene

HORTICULTURE IN THE DELAWARE VALLEY

Volume 9, Number 5 May/June 1981

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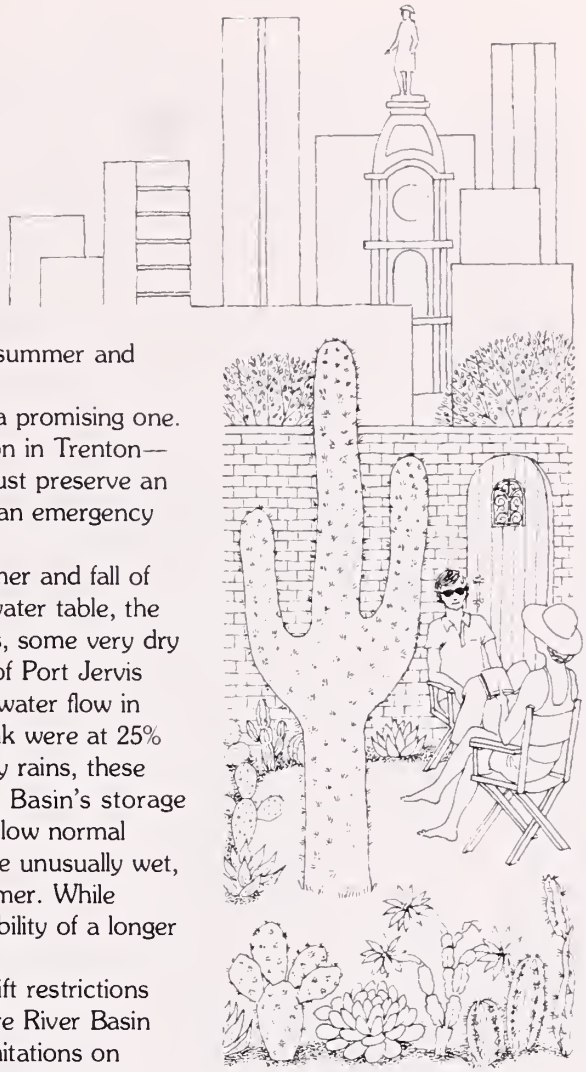
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CORRECTION:
We had a call from Longwood's taxonomist, Dr. Donald G. Huttleston, and two letters from our sharp-eyed readers who spotted the misidentified night blooming cereus in the March *Green Scene* on page 25. The correct botanical name is *Epiphyllum oxypetalum* (not *Hylocereus undatus*). Thank you for letting us know; it keeps us on our toes. The Editor.

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DIGGING IN FOR THE DROUGHT

by Henry H. Reichner, Jr.



Will our lawns, gardens, trees, and shrubs survive this summer and come through in good shape?

The prospect, at least in early February, has not been a promising one.

At January's end, the Delaware River Basin Commission in Trenton—they are the "water kings" of the Delaware Valley who must preserve an adequate flow in the Delaware—advised the Society that an emergency drought condition existed in the Delaware River Basin.

In the Philadelphia area the dry period during the summer and fall of 1980 has resulted in a significant lowering of the ground water table, the loss of flow from springs, and until the late February rains, some very dry reservoirs. In the upper Delaware Valley, north and east of Port Jervis New York, the three principal reservoirs that control the water flow in the Delaware River, Cannonsville, Pepacton and Neversink were at 25% of their 270 billion gallon capacity. Even after the February rains, these reservoirs, which represent 90% of the Delaware River Basin's storage capacity, were only at 57% of capacity and significantly below normal levels for that time of year. Unless our spring proves to be unusually wet, we can expect some kind of drought conditions this summer. While nobody really knows, metereologists differ as to the possibility of a longer period of drought.

Having learned a lesson from a premature decision to lift restrictions on the use of water during the 1963 drought, the Delaware River Basin Commission, as of the end of February, indicated that limitations on water use would be continued until reservoirs were at normal levels. At the time this editorial is published, we may well be free to do what we wish with our water supply, although the bad situation with regard to ground water levels will remain with us for some time.

There is a lesson in this for all of us who would like to maintain our grounds and gardens—no matter what the size—in top-notch or even reasonably good condition. Many of us have become so accustomed to a super-plentiful supply of water that we rely on the hose and other irrigation means to support moisture loving trees, shrubs and plants that might not otherwise grow well where we have planted them. Some of us have overlooked the need for replenishment of the organic materials in our garden to retain moisture. And, we have become somewhat careless about mulching.

Now is the right time for all of us to look at our plant selections and plant location from a practical as well as an aesthetic point of view. If we insist on placing moisture-loving and shade-loving perennials, annuals and shrubs in sunny and dry places, we must be prepared to pay the price in one way or another. While it is a little late this year to start selecting and planting perennials that are drought resistant or, at the very least, tolerant of dry weather, there are still a number of opportunities for local or mail order purchases. And there is certainly time now to dig in more organic material and to put on a heavy mulch.

Aside from the above, the wise gardener would do well to be prepared for a long dry summer by catching and storing rain water in small reservoirs, 50-gallon drums, or other alternatives.

Your Society has prepared a fact sheet about gardening during the drought and in dry weather that they will be happy to send on request. Send a stamped self addressed envelope to Drought, PHS, 325 Walnut Street, Philadelphia 19106. On the other hand, if you have some good ideas of your own about coping with this problem, we would like to know about them.

Henry H. Reichner, Jr. is president of the Pennsylvania Horticultural Society and executive vice president of the Chamber of Commerce. He holds a degree in landscape architecture from the University of Pennsylvania.

Espaliers at Chanticleer and Minder House

by Adolph G. Rosengarten, Jr.



Cotoneaster microphyllus (Exposure west or southwest)

photos by Ronald Juftes
Plant Identification by Howard J. Holden

Espalier is a relatively recent technique in ornamental horitculture about which a good deal remains to be learnt.* Originally it was, I suggest, an extension to the kitchen garden of the well-ordered rows of grapevines in European vineyards. Thus in its edition of 1910, the *Encyclopedia Britannica* described "espalier" as "a row of stakes, originally shoulder high, on which fruit trees, shrubs and flowers are trained—the advantages of the method is that the fruit is more easily got at." Similarly its extensive article on "horticulture" briefly dismissed the method as a "subsidiary to walls as a means of training fruit trees [in which] espalier rails were formerly much employed." Furthermore, if the word espalier appears in two recent works on the history of English gardens, I missed it.**

Given the uniformity of the contemporary house, while the doctor buries his mistakes and the architect plants vines, the householder, within the limits of his ever diminishing

* See Espaliers: For Ornamentation and Fruit by L. Wilbur Zimmerman, *Green Scene*, January, 1975.

** Anne Scott-Jones, *The English Pleasure Garden* (London 1977) and *The Garden* (London 1979) being the book of the Exhibition at the Victoria and Albert Museum in 1979.



◀ *Ligustrum japonicum* (Exposure: south wall).

Cedrus atlantica 'Glauca'
▼





English holly *(Ilex aquifolium)* This wall gets shade year-round from a house not shown here. (Exposure: north/northwest)

curtilage, struggles endlessly to rise above conformity. And should he elect to embellish his abode with espalier, an intractable nature makes the exposure a limiting factor. That is to say, the direction that a wall faces controls the choice of the plant to be espaliered.

Thus one can successfully train English holly *(Ilex aquifolium)* on a wall that faces north or northwest. For not only does the wall protect against the wind but the plant gets little or no sun in winter and therefore once frozen stays frozen.

Where the face is to the west or southwest, cotoneaster *(C. microphyllus)* is recommended, at least on a stone wall. However, white stucco possibly, by reflecting the sun, presents difficulties, and on such a wall at long last two *Cedrus atlantica 'Glauca'* have survived. A contributing factor here may be the shade cast until mid-afternoon by a nearby sycamore.

Walls facing south present problems. On such a stone wall we have had no luck with *Magnolia grandiflora.* After interring our third attempt, we switched to hardy orange *(Poncirus trifoliata)*, which may have been the better choice to begin with. Though endowed with obdurate thorns, this small tree has white flowers in the spring, small but inedible oranges in the autumn and grows to the height of about 16 ft. After surviving two winters, we hope the replacement will continue to grow in stature and in grace.

Against similar walls, results varied in the case of two evergreens. One is curly leafed privet *(Ligustrum japonicum).* This is a "conversation" plant but, subject to winter kill, it should be sprayed with wilt-proof in the autumn and covered with burlap in winter. Fortunately, English yew *(Taxus baccata)* flourishes like the proverbial green bay tree against

continued

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Espaliers continued

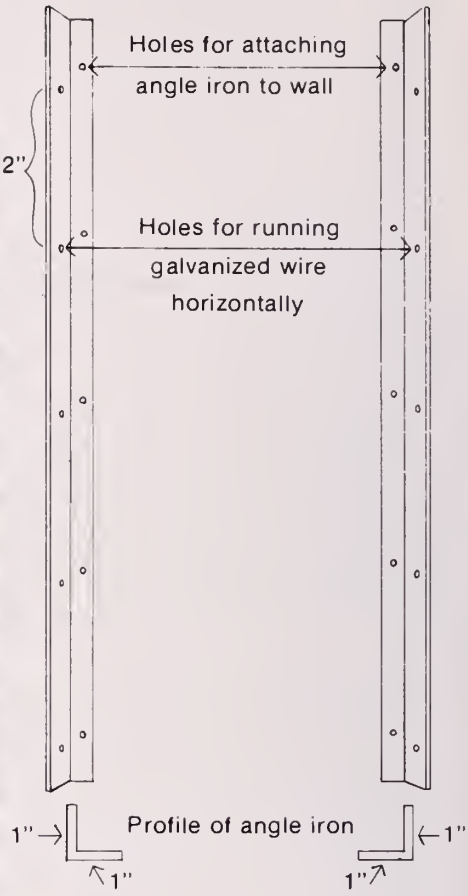


Taxus baccata



Chaenomeles speciosa

Sketch for attaching supports for espalier materials. Not to scale.



plaster, and therefore requires constant rigorous hand-pruning. One can also espalier apples and pears against plaster. But if purchased commercially, they are expensive and "to do it yourself" requires more patience than I have. (Wilbur Zimmerman's article mentioned in the footnote gives explicit instructions). The flowering quince *(Chaenomeles speciosa),* which Zimmerman also recommends, is effective in the spring. However, both the quince and the apple and pear trees tend to wilt toward the end of a hot and rainless summer.

This boxing of the compass must end with walls facing east. Here we lack experience, since the only one heretofore available is covered with climbing hydrangea *(H. anomala petiolaris).* Recently a lean-to was torn down and a suitable wall exposed on which to experiment. We will also continue testing in various exposures small flowering deciduous trees and shrubs.

Finally three caveats to the neophyte before he goes whole hog for espalier. Support must be placed on the wall and unless your green thumb can handle a mason's trowel, you may need professional help. One method is to use one inch angle irons. They are pierced with holes, 12 in. apart, through which to stretch horizontally galvanized wire. Morticed vertically into the wall, the irons are separated at intervals determined by the area to be espaliered. For a fan shaped espalier large eyelets are driven into the wall at strategic points and also joined by wire. The second is to avoid pushing a branch behind the wire. Tie it loosely on the outer side with string. "Just as the twig is bent, the tree's inclined" is as true today as when written by Alexander Pope; in time the string can be cut off. The last warning is that keeping an espalier in condition entails fertilizing, watering and pruning. In respect to the latter, "think twice and prune once."

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Adolph G. Rosengarten, Jr. moved into Chanticleer in Wayne on its completion in August 1913 with his parents. Continuing their interest in horticulture, he has devoted much time and effort to its embellishment in both the English and French landscape traditions. Chanticleer was the scene of one of the Society's symposia in 1976.



photos supplied by Longwood Gardens

Magnolia grandiflora (Bull Bay)

THE SOUTHERN CONNECTION: *Magnolia grandiflora*

by Edwin A. Peeples

When I was growing up in Atlanta, Georgia, my friends and I got a good deal of innocent merriment from novels by northern authors who had heroines appear with magnolia blossoms in their hair. These authors evidently supposed a magnolia blossom was about the size of a gardenia, owing to living in an area where the chief magnolia they would see would be the small flowered *M. denudata* from China or the *M. obovata* from Japan.

To a southerner, however, the named magnolia conjured up the *M. grandiflora,* or *macrophylla,* as Gray's *Botany* calls it and no other. The blossom of this deliciously lovely tree is 8 in. in diameter. There is even a species call *gloriosa* with a 12 in. flower. One of these flowers in a heroine's hair would conceal her as completely as a parasol. From the weight standpoint, she would be more comfortable wearing half of a Rocky Ford cantaloupe.

A heroine strong enough and courageous enough to dare the feat of wearing a magnolia would walk in a cloud of the most renown southern fragrance, for the blossom of *M. grandiflora* emits a glorious perfume. It is heavy and rich and partakes of lemons and melons with hints of cloves or cinnamon. Alas, unlike the flowers of *denudata* and *obovata,* the life of the *grandiflora* flower is brief, no more than dawn 'til dusk, but in that brief moment, pervasive and overwhelming.

continued



photo by R. W. Thomas for Longwood Gardens

M. grandiflora in Longwood Heather Garden



photo supplied by Longwood Gardens

M. grandiflora (Bull Bay)

Throughout the coastal south, from Virginia to Texas, the *M. grandiflora* is commonplace. The great trees, rising 80 to 100 feet, dot the edges of lawns and are such dense umbrellas that, if you crawled under one on the brightest summer day, you would be in almost complete darkness. If you hid under one in a storm, you might get struck by lightning, but you wouldn't get wet.

Anyone who has truly known *M. grandiflora* yearns to have one about, and, when I moved to Pennsylvania, the magnolia was one of the southern pleasures I missed. But most gardening books urged that *M. grandiflora* was not reliably hardy above Zone 7, which is, roughly, coastal Virginia. In Zone 6, the harsh winds and chills of winter would kill this delicate tree of which Paul Hamlyn, in his *Pictorial Encyclopaedia of Plants and Flowers* says: "Many botanists believe these trees are one of the most primitive of existing families of flowering plants."

Well. We accepted all of this gospel until Longwood Gardens completed its rock garden sometime in the late 1950's. The upper path of this garden, which circles to the bridge across the falls, must be a good 50 ft. above the pond. Looking down from this path, one looks into the top of an arc of *M. grandiflora*. All of these trees are flourishing and, from early June to well into September, all are enriched with magnificent flowers: white with a suggestion of cream, when they first open, and taking on a slightly yellowish tinge as the day progresses. The upper walk is planted heavily with pines of several varieties. These pines and the wall that supports the walk screen the *M. grandiflora* from the northeast, north and east winds and all winter sun save the afternoon sun from the southwest.

This arrangement agrees with that called for in the fifth printing, 1973, of the Brooklyn Botanic Garden's *The Hundred Finest Trees and Shrubs for Temperate Climates,* which says that *M. grandiflora* can be raised in Zone

6 as individual specimens in sheltered locations, provided they are given reasonably full winter shade.

From the time my wife and I noticed and admired the Longwood magnolias, we considered trying one of our own. On trips to visit my sister in Atlanta, we saw magnolias she had espaliered on her house, displaying the flowers as if they were some strange exotic fruit. This suggested two situations we had which might be possible for magnolias, and, in 1961, finding an Atlanta nursery with 12 in. to 18 in. magnolia saplings at about $5.00 each, we bought two and brought them home.

We planted these in two locations where we knew we had microclimates: one in an angle against our house that got little winter wind and winter sun only the last hour or so before sunset; the other in another angle absolutely protected from winter wind and overhung by a pin oak, but open to winter sun from noon until dusk. The tree in the first location grew more rapidly than the tree in the second and bloomed first. But it did not have the lath-house effect that the oak provided, and a severe winter killed it. It kept trying to come back from the roots, but the chill browned it out each year until it died.

Unlike *M. denudata* and *M. obovata,* both of which we know well in this clime and both of which are deciduous, *M. grandiflora* is an evergreen. Its leaves, glossy all winter as green patent leather, appear, even in the cold, to continue some essential photosynthesis, for old leaves do not turn brown and drop until the new, spring growth is well advanced. Also, these leaves, which first turn yellow and then brown, remain firmly fixed until the last of their green disappears, which tends to confirm that they are performing an essential function. Clearly, then, winters cold enough to brown out all or most of a magnolia's leaves must presently kill the tree.

The magnolia that we planted in the angle with more sunny hours, but with the protection of the oak, is still with us. Now more than 17 years old and thirty feet tall, it has produced as many as 50 blossoms in a single summer. After the blossoms fade and the petals fall in twists of russet suede, the cone forms and grows. Magnolia cones are more like pineapples than pine cones. As they grow, their color changes from apple green to bright yellow to the russet suede look and finally to a greenish black. Between the russet suede and greenish black stage, the cones commence to disgorge bright scarlet

One of these flowers in a heroine's hair would conceal her as completely as a parasol. From the weight standpoint, she would be more comfortable wearing half of a Rocky Ford cantaloupe.

seeds the size of grains of corn. Crushing these seeds produces an intense, highly spiced magnolia fragrance. Bernard McMahon, in his *American Gardener,* tells us how to plant these seeds to get new trees:

"The seeds of the different kind of magnolia should be sown immediately after being ripe, or be preserved in damp sand or earth until March; for, if kept dry until that time, very few or any will vegetate till the year following; and indeed may not until the second season, even if sown when ripe. They may also be propagated by layers and suckers and by grafting and budding upon on another."

We have found that the best way to germinate *M. grandiflora* is to first store the seeds in baggies full of peat moss in the refrigerator for 150 to 180 days and then plant them.

The Bull Bay or evergreen magnolia, other names for *M. grandiflora,* is one of a numerous family. Hamlyn says there are 10 genera and about 100 species in the family *Magnoliaceae,* over 70 of which are included in the genus, Magnolia. Curiously, the most prevalent member of the family in the east is not the flowering one we see in early spring with tulip-like, lavender and white blossoms but the prominent member of another magnolia genus, *Liriodendron tulipifera,* the tulip tree or tulip poplar.

Apart from its susceptibility to being done in by a hard winter's cold, the *M. grandiflora,* with its great leaves dark and dense all winter, is vulnerable to ice and snow. Ice storms can build enormous weight on the leaves and break branches and limbs. Snow also tends to stick to the leaves, but, if there is wind while the snow is dry, the snow will tend to shake out of the tree. Fortunately, the limbs and branches of the *M. grandiflora* are supple, can take considerable weight without breaking and can recover their posture. I've seen parts of our magnolia, bent 40° with ice without breakage, almost entirely recover their original posture. The chief forces of winter that damage *M. grandiflora* are the drying chill winds and the winter sun striking frozen leaves early in the day.

Any who have known the southern magnolia miss it in other climes and long to see it again. One illustrious American longed for it in France. In 1786, Thomas Jefferson sent these words from Paris to Dr. David Ramsey in Charleston, South Carolina:

"... a person whom I am very desirous of obliging has asked me to procure ... some plants of the *Magnolia grandiflora* ... if you can be instrumental in procuring them, you will gratify me much. They had better come to New York and from thence be sent here by packet."

CAUTION: Attemtps to grow *M. grandiflora* in Zone 6 should not be made by any who do not have a perfect situation for it and who are not willing to gamble. The winter of 1976-77 killed two of the Longwood trees and burned out most of the exterior leaves on ours. Although ours survived, it didn't resume blooming until last summer. The winter just past, 1980-81, has burned ours again. We won't know until June or July whether it will survive. So, growing *M. grandiflora* in Zone 6 can be done, but not easily.

●

Edwin A. Peeples is a frequent contributor to *Green Scene.*

Spectacular Sentinel of the Summer Garden: *the Musk Thistle*

by Devon Reay

Honey bees and bumblebees burrow deep in the soft massed petals of the rose-lavender musk thistle, *Carduus nutans,* that flowers from late May through July. So do rose bugs; they lodge in pairs and cling, so you can cut a flower and crush it, bugs and all, between two fire bricks. This renders your roses virtually pest-free if you only have two or three plants, since rose bugs prefer thistle blossoms.

The musk or nodding thistle, a Eurasian biennial of the aster family, has color and contrast, texture and delicate fragrance. Its light-green leaves and interrupted stem wings are thorn-tipped, except for about eight inches of stem directly below each red-tinged bract. Here the stem curves gently so each flower faces outward, instead of straight up like the Scotch and pasture thistle. This accounts for "nodding."

A single-flowered pasture thistle that rarely grows more than 30 in. tall 2½ to 3 inches across, has been called the largest flowered thistle, but the blossom of a wild musk thistle, growing in full sun by a country road in southern Delaware, measured more than three inches.

As a cut flower, the musk thistle retains its fresh beauty for six days, but outside under the summer sun it fades after three. However, a day or so before a flower if fully open, it is near-rose and quite lovely.

The thistle thrives in poor sandy soil; rich loam just makes it larger and leafier. It does best in full sun, but partial shade does not bother this spectacular plant, which grows over five feet. Generally, the fewer blossoms per plant, the bigger each flower is. And faded flowers should be cut every other day, four or five each five-foot plant.

Mrs. Dresdner, an eastern gardener whose favorite flower is the musk thistle, although she loves white fragrant flowers, grows just two every second year, one in the center of her small partly-shaded vegetable garden, and one close to the south side of the garage. The origin of her first thistle was close to a country road in southern Delaware.

Last spring she sowed seed of a rose-red thistle, listed by Burpee seeds, and a few choice musk thistle seeds, in a wide clay pot. Not one sprouted. Same result from two separate garden sowings. But in October three tiny musk thistle seedlings appeared in the south corner of the garden, a spot raked clear after the tomato plants were yanked, chopped and buried. These seedlings grew very fast during the shortening days and cool weather; they lay flat against the earth but the leaves grew wider and wider. Next spring, the one left to grow and blossom will rise and grow vertically as the weather warms.

They treated earache with the juice from boiled and mashed roots, and they held hot thistle juice in their mouths to relieve toothache. Thistle root tea was used for a number of ailments and discomforts such as hastening and easing childbirth.

The musk thistle is not as large, not as majestic as the Argentine or Scotch Thistle whose thorn-tipped foliage has a silvery nap, but its blossoms are much larger. And, once you grow a Scotch thistle, for years after flat furry little seedlings grow like weeds all over your garden, even though you cut each finished flower. They flourish even after chopping the huge plant in short lengths with a sharp spade and burying them deep under the compost pile.

"Pasture thistle flowers are very fragrant and rich in honey. Bumblebees love them, they nose in deep, sipping the nectar till they are too intoxicated to fly away," says a New England naturalist. "Pasture thistles are also known as bull thistles."

The American Indians peeled, boiled and ate the stalks of this native American thistle. They treated earache with the juice from boiled and mashed roots, and they held hot thistle juice in their mouths to relieve toothache. Thistle root tea was used



photo by Barbara Bruno

Carduus nutans (Musk thistle)

for a number of ailments and discomforts such as hastening and easing childbirth.

In the ancient Orient the thistle was an emblem of royalty, and coins bearing thistle designs were worn by princes to show their patronage of the arts and crafts. And the gossamer down of the flower was prominent in Norse folk stories enjoyed by all ages for centuries; now they are retold in books for children.

"Where the thistle lifts a purple crown
Six feet out of the turf,
And the harebell shakes on the windy hill—
O the breath of the distant surf!"

Francis Thompson

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Devon Reay is a frequent contributor to *The Green Scene*

Propagating Varieties of *Acer palmatum*

by James S. Wells.

The Japanese maple, *Acer palmatum*, has produced a certain number of mutations that have become firmly established in the horticultural world in their own right. Dark purple colored forms such as *A.p. 'Bloodgood';* types with serrated foliage, *A.P. 'Dissectum,'* and pendulous forms have been selected, grown, and appreciated for a very long time. The standard method of propagating has been to graft these selected forms onto seedlings of an *A. palmatum*. This method is quite satisfactory and excellent plants have been produced in this way. If seed has been taken from a vigorous growing form of *A. palmatum*, then the resulting understocks will tend to transmit their vigorous outgrowth to the grafted variety.

Some Grafted Varieties Too Vigorous

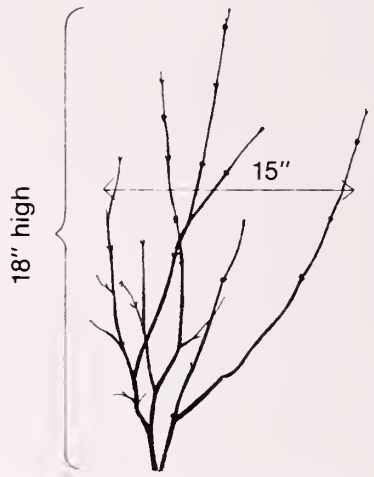
With the greatly increased interest in plants of limited size for the small modern garden, *A. palmatum* and some of the grafted varieties can prove to be a little too vigorous. One way in which the sizes could be reduced without disturbing the innate quality of the plant would be to root these cultivars from cuttings. Plants on their own roots grow more slowly and certainly where plants are being grown for bonsai treatment, then it is even more desirable to have the plants on their own roots.

The rooting of Japanese maple cuttings, however, has not proven to be quite the simple process that one would wish. Many attempts have been made, sometimes with indifferent results, and the word is even if you do manage to root a few, the quality of the plant is not likely to be very good. Most recently, however, research has determined that it is possible to root many of the selected forms of *A. palmatum* successfully and to produce good plants with first class root systems that will develop at a reasonable rate into first class specimens. In order for this method of propagation to be successful, close attention to a number of related details is essential.

Timing: Timing is of prime importance in the propagation of any plant. When is the best time to take the cuttings? Using *A.p.* 'Bloodgood' as a typical example: in New Jersey, the optimum time would be about the 20th of May, plus or minus a week or two on either side. Cuttings can be rooted at a later date, i.e., up to mid-June, but, as will be seen later, that presents an additional hazard.

Types of Cuttings: The best cutting is a strong, thick, vigorous shoot of the current season's growth. The thicker and stronger the shoot, the better. Ideally, the caliber of the stem should be close to pencil thickness. Thick stems of this type may not be easy to find but the thickest, strongest terminal shoots should be used for best results. Thin shoots, even if taken from the side of a strong central growth, will not root nearly as rapidly, or as well, as the heavier grade. Thin shoots from old, slow growing mature plants are even less satisfactory for they will root indifferently or not at all. It follows,

Two Growing Seasons



therefore, that is may be necessary to cut back an old plant fairly drastically in order to induce the kind of strong vigorous shoots that we need for the best type of cuttings.

Handling the Cuttings: Cuttings should be removed from the stock plants early in the morning when the growths are fully turgid and, without a moment's delay, should be submerged in a bucket of water, for it is essential that during the time the cuttings are being gathered, made and inserted in the propagation bench they do not become dry for even an instant. Cuttings as gathered should be immediately damped down and then placed in a box lined and covered with wet burlap.

Making the Cuttings: Ideally, the thickest shoot, 6-8 in. in length, should be used, and should consist of at least two or three nodes. Any thin tip should be removed and the two lower leaves should be removed at the base of the cutting. The cuttings should then receive a "heavy wound." This is made by removing a thin slice on one side of the cutting for a length of 1 to 1½ in. and sufficiently deep to remove the outer bark and just to reveal, but not cut into, the central woody tissue. The thickness of such a slice when removed would probably be no more than 1/16 in. A single heavy wound of this type is sufficient for most maples.

Hormone Treatment. A hormone treatment is essential for success. *A.p. 'Bloodgood'* will respond to a 2% mixture of IBA in talc: the mixture should also include 5% Benlate. This is a relatively standard formula but is nearly three times as strong as Hormodin #3, which is the most generally available mixture. Hormodin #3 will have a modest effect but the stronger powder is greatly superior. Cuttings should be dipped into this powder immediately after wounding, covering the bottom of the cutting up to the top of the wound, and the treated cuttings immediately recovered with the damp burlap until sufficient cuttings have been accumulated to insert into the propagating bench.

Rooting Medium. The best medium is a 50-50 mixture of an acid type relatively coarse Canadian peat moss, and a medium grade perlite. A similar mixture of peat and sharp sand is equally satisfactory. As they are made, the cuttings should be inserted into the rooting medium, so that the bottom two inches of the cutting is buried. It is not necessary to tamp in the cuttings firmly. In fact, a loose open porous medium is to be preferred.

Misting. Some form of automatic misting is almost essential if the cuttings are being rooted in a conventional propagating house. The only exception to this might be an attempt to root the cuttings in a well constructed tight frame with bottom heat provided by electric cables, and the frame itself situated on the north

side of a building so no direct sunlight can fall upon it. The importance of keeping the cuttings moist and not allowing the foliage to dry out even for 60 seconds from the moment they are gathered, is vital. The only time they can be allowed to dry out to a modest degree is during the night; but from the moment of sunrise to sunset the leaves of the cuttings must be kept moist.

Bottom Heat. A good high temperature in both the house and on the bench is beneficial and will induce rapid rooting. Custom sets the optimum bench temperature at 70° F, but if sun heat builds up the air temperature in the house to 80° or even 90°, as long as the cuttings are kept moist buy frequent misting, these high temperatures are beneficial rather than not. However, reason and judgment should always prevail, and under conditions of excessively high temperatures or exceptionally high light intensity, some shading of the propagating structure may be necessary.

Under these conditions cuttings will commence to root quite rapidly, and, if everything is as it should be, the cuttings may be strongly rooted in three weeks. As soon as the root system is well developed, i.e. with roots two to three inches in length the cuttings should be lifted and potted.

A mixture of 30% perlite and 70% peat is a good potting mixture and the cuttings should be handled very carefully to avoid damage to the roots, and above all, again handled swiftly so that they do not dry out.

At the time of potting, one leaf should be removed from the middle node. This will probably leave two leaves on the top node and one on the intermediate node. The removal of this leaf will encourage the rapid development of the latent growth bud at that point. Once the cuttings have been potted they should be returned immediately to the same area from which they were just lifted. They should remain under the same conditions that prevailed during the rooting process until the roots circle the pot and strong root growth can be clearly seen. Then, and not one moment sooner, can the young plants be gently weaned, by slowly reducing the frequency of misting and giving them a little more air when outside conditions will allow. This slow hardening up process to bring the cuttings from abnormal to normal conditions may require a period of two or three weeks.

Supplementary Light. Once the cuttings have become hardened and root growth is evident they should be removed from the propagating area, placed in a shaded greenhouse, and immediately provided with supplementary light. This move may also require that the plants be syringed by hand quite regularly and frequently for a day or two, thus providing a further period of slow transition from the propagation house to normal growing conditions.

The "secret" of bringing many plants through the first winter as rooted cuttings is to induce new growth on the cuttings immediately after rooting. If this new growth can be induced, then the survival of these cuttings is more or less assured. Cuttings rooted late in the season, which perhaps are well rooted but which have not made that movement towards new growth, may very well die no matter how carefully they are stored during the first winter. Japanese maples are quite sensitive to additional light, therefore the provision of supplementary light at about 300 foot candles through the bulk of the night will stimulate the plants into immediate growth.

While continuous lighting from 9 pm to 4 am will produce the best results, a time clock to control cyclic lighting is equally satisfactory. The advantage of this slightly more complicated method is that it saves power. If cyclic lighting is used, the time clock is set, dividing each period or cycle into three equal parts. The center section of the cycle is the one that is lighted giving you a 15 minute cycle during which five minutes out of each 15 minutes would be lighted: five minutes light, 10 minutes dark throughout the 9 pm to 4 am period). Alternatively, a period of at least four hours of continuous light can be provided in the middle of the night from 10 pm to 2 am.

Under these conditions the newly potted actively rooting cuttings will commence new growth, and the most likely source of the first shoot will be from the bud, which was in the axil of the leaf removed when potting. A strong vigorous shoot may arise from the base, or new growth commence at the top of the cutting. Wherever it may arise, every effort should be made to encourage the development of these new shoots. The plants should be gently fed with liquid fertilizer, i.e. 20-20-20 and maintained under these conditions throughout the rest of the summer to encourage the maximum top growth possible.

Over Wintering. About the first of October supplementary light can be discontinued and the plants allowed to come to normal dormancy. They should be held through the winter under conditions which will allow the air temperature to come close to freezing without actually doing so, i.e., about 33° F. This will bring the plants to dormancy and leaves will drop; their normal winter dormant period is essential if they are to grow properly the following year.

Subsequent Treatment. The young plants should be repotted or planted out early in the spring, before new growth commences, i.e. not later than mid-March. New growth that was made the previous summer should be cut back to half its length and the plants left to grow in a normal manner. Normally, they will break into new growth at the usual time, producing a sound root system and a good branch system by the end of the growing season, fairly dense and perhaps 12-15 in. in height. Once a plant is well established it can be handled in an orthodox manner for any future development.

These methods appear to work on most cultivars of *Acer palmatum,* but with varying percentages of rooting according to variety. The pendulous forms of *A.p. 'Dissectum'* do not appear to root quite so readily, but with the basic method perfected and understood, I think most propagators should be able to produce reasonable percentages of any clone.

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James S. Wells was awarded the PHS Distinguished Achievement Medal in 1976. The citation read in part: "During his thirty years of activity as a propagator and nurseryman, he has always been ready to answer questions or demonstrate techniques. His crowning achievements along this line are the book *Plant Propagation Practices* [Macmillan, London, 1955], which he wrote, and the International Plant Progagater's Society, of which he was a founder and first President." Cross was the first to propagate vegetatively hybrid rhododendrons on their own roots on a commercial scale.



photo by Molly Adams

Yarrow, snap dragon, and daisies

Evolving from a Low to a High

by Helen Tower Brunet

Carol and Brent Saville had been city dwellers when they bought a part of the Warren Kinney property in New Vernon, New Jersey. They knew they would have their hands full restoring the house, a one-time 18th century farm house, which had been used as a bunk house for farm workers for the past 50 years.

Because Carol enjoys cooking with herbs, they decided to plant an herb garden right away, which their gardening friends assured them could be "low maintenance," allowing them time for their renovation and for their two careers.

Brent Saville, a designer specializing in museum exhibition work, laid the plan for the herb garden, using different elements of style from the medieval to the colonial periods. Carol, a retail buyer, whose avocation is history, did the research. The garden would be surrounded with a naturally weathered picket fence like the colonial garden, which would in turn be bordered with hosta, a plant

The focal point would come later an "apple house," or gazebo of living apple saplings trained to make a small enclosure; a splendid spot for ice tea on a hot afternoon.

common in medieval times in Europe. Happily there was already a clump on the property, so dense it supplied endless edging. The garden beds were raised and laid out in geometric design, with walks of fine gravel between. The beds were edged with bricks from a crumbling chimney on the house. Carol planted more than 80 different perennial herbs, including a gooseberry bush that produces berries for vinegar, wine and jam.

The Savilles found their herb garden to be as low maintenance as their friends had promised. Some weeding, yes, but the heavy mulch of cocoa hulls in summer and salt hay in winter helped. Harvesting, too, was part of the fun, and every herb is used in either cooking or dyeing fabrics or both. Protection from the deer would be assured by Hector, a Scottish deer hound who supposedly would chase the deer into the next county, or at least on to the next property.

Flushed with the success of their first gardening venture, the Savilles decided to plant some fruit trees. Surely every 18th century homestead had to have an orchard. Carol, in her endless diggings into the past, was taken with the idea of an allee of fruit

1.



photo by Brent Saville

2.



photo by Brent Saville

3.



photo by Brent Saville

1. Laying out the Knot Garden

2. The Knot Garden completed

3. Carol Saville works on the wattle fence

Maintenance Garden · · · *and liking it*

trees, punctuated at the end with a garden ornament or structure. The following spring found them planting an allee of peach, cherry, plum, apricot, nectarine and apple trees in pairs on the opposite side of the house from the herb garden. The focal point would come later, an "apple house," or gazebo of living apple saplings trained to make a small enclosure; a splendid spot for ice tea on a hot afternoon

Next, with the herb garden and orchard under control, the Savilles decided they should expand the garden area just a little. This low maintenance gardening was really fun, especially when you worked together. Brent got out the design board again, and presto, on paper was a rose garden that would adjoin the herb garden, laid out in the same geometric design, but with the image

continued



photo by Molly Adams

Herb garden. Road is to right of house and knot garden (not shown here) is left.

High Maintenance Garden continued

reversed. They selected old shrub roses like damask rose *(Rosa damascena 'Bifera')*, apothecary rose (*Rosa gallica*) considered ancient roses, and some later ones such as the moss rose (*Rosa moschata*) and a few 20th century hybrids too.

The rose garden was only slightly more work—but such a joy. Brent did not feel that spraying the roses and vigilant pruning were too much work for the pleasure involved.

The following year the Savilles completed the renovation of the front of the house and decided it looked bare without something between the house and the road. An all-blue flower garden would be perfect. Together they planted a mixture of plumbago, periwinkle, Jacob's ladder, anchusa, mertensia, puschkinia and wild geranium. And, since having a garden without a border would be like having a painting without a frame, they designed a Belgium fence of fruit trees between the blue garden and the road. Sixteen varieties of pear trees were used, including 'Clapp's Favorite' to pollinate the Armed Palmate Verrier Espalier they had planted against the front of the house.

the knot garden

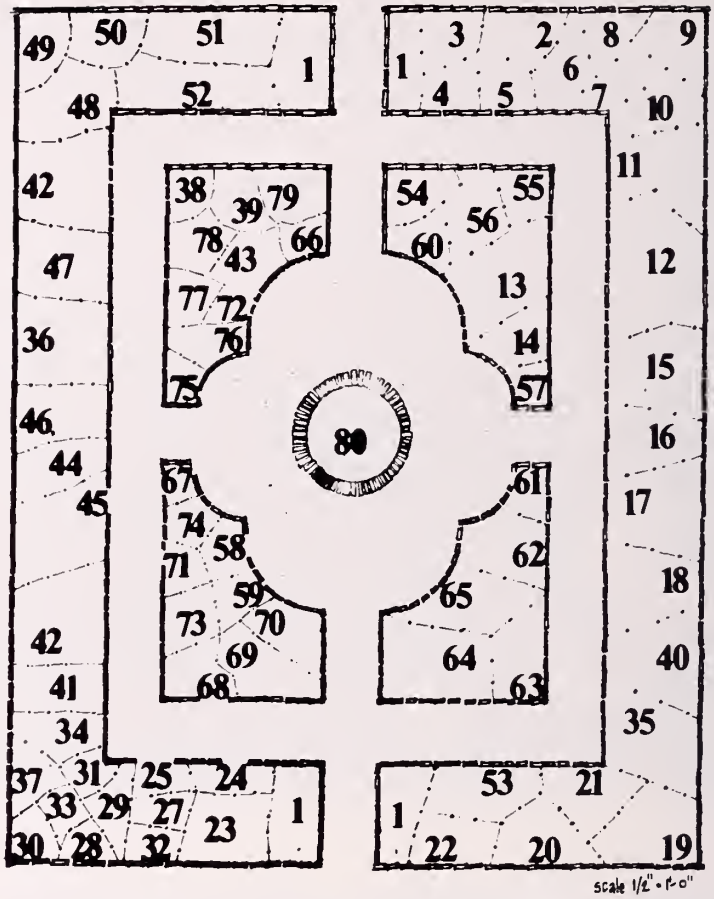
By now the work on the back of the house was just about complete,



photo by Molly Adams

Rose garden

Herb Garden



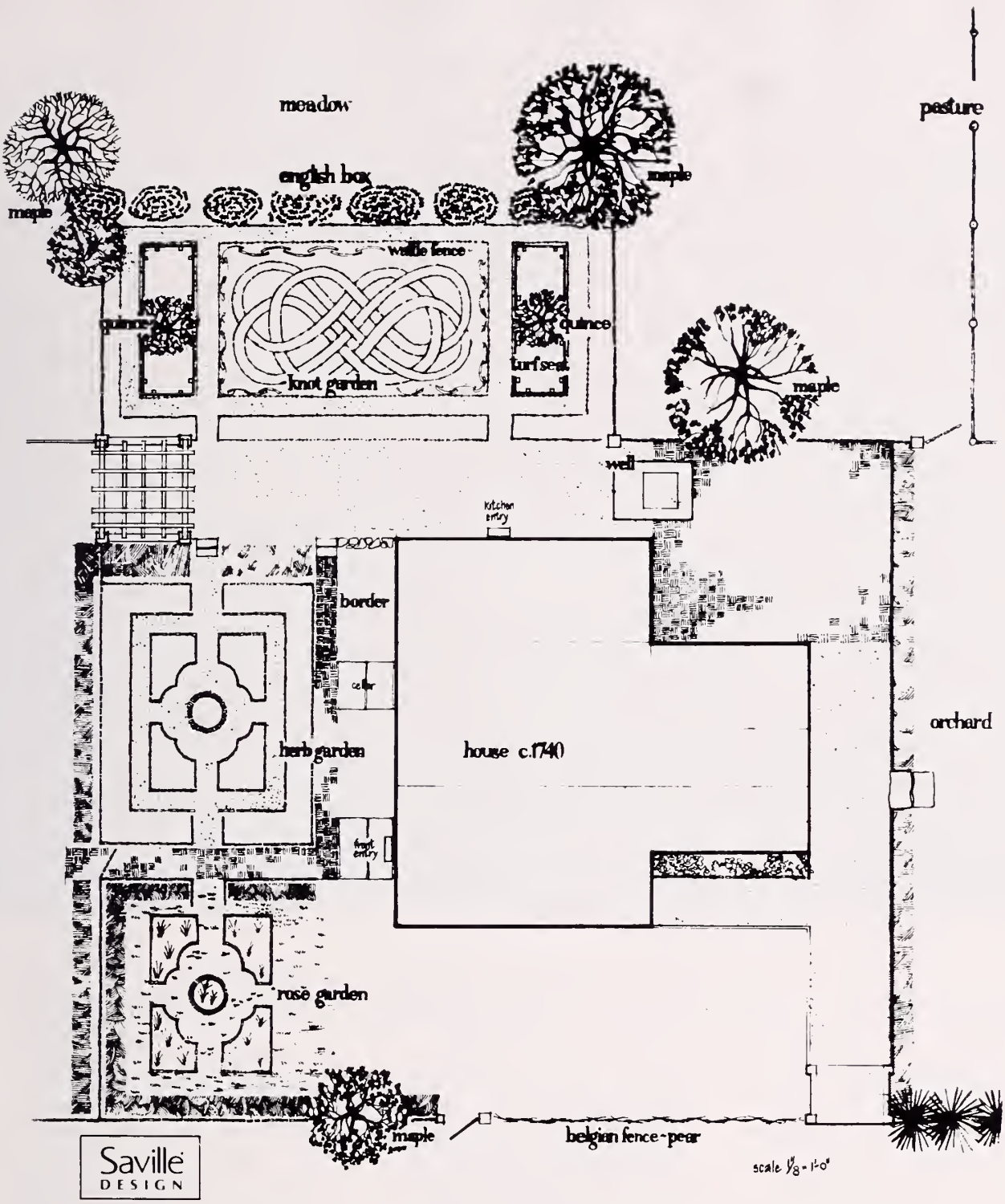
scale 1/2" = 1'-0"

1. Hosta
2. Rue
3. Goat's Rue
4. Forget-Me-Nots
5. Scarlet Pimpernel
6. French Sorrel
7. Garden Sorrel
8. Maiden Pink
9. Teasel
10. Horehound
11. Coltsfoot
12. Costmary
13. Sweet Basil
14. Miniature Basil
15. Yarrow
16. Hyssop
17. Calendula
18. Lady's bedstraw
19. Tansy
20. Feverfew
21. SKarret
22. Lovage
23. Jacob's Ladder
24. Trailing Germander
25. Myrtle
27. Dill
28. Sea Fennel
29. Lungwort
30. Purple Loosestrife
31. Wall Germander
32. A-Silver King
33. A-Silver Mound
34. -Tarragon
35. -Wormwood
36. -Southernwood
37. Lemon Verbera
38. Herb Robert
39. Roman Chamomile
40. German Chamomile
41. Sweet cicely
42. Gooseberry
43. Melilot
44. St-John's Wort
45. Coriander
46. Aconite
47. Mountain Bluet
48. Garden Heliotrope
49. Meadow Rue
50. Angelica
51. Blue Flag
52. Perrenial Flax
53. Ajuga
54. Lemon Balm
55. Lady's Mantle
56. Orris Root
57. Campanula
58. Garden Sage
59. Purple Sage
60. Pineapple Sage
61. Cudweed
62. Dead Nettle
63. Heartsease
64. Chives
65. Sweet Woodruff
66. Dittany of Crete
67. Sweet Marjoram
68. Pot Marjoram
69. Catnip
70. Houseleek
71. Elfin Herb
72. Lavender
73. Rosemary
74. Rose Campion
75. Salad Burnet
76. Winter Savoury
77. Borage
78. Bouncing Bet
79. Bloodroot
80. Thyme

with the kitchen entrance in place, giving on to a view of a gently sloping field and woods beyond. Another smallish garden would be nice, Brent and Carol agreed—something low that wouldn't block the view, and preferably a garden that would be pleasing in winter as well. While they were still in the thinking stage, the Savilles took a spring trip to England. There they found the perfect kind of garden to put at the back of their house—a knot garden.

Brent design it on paper, from ones they had seen in England. It would be surrounded by a low wattle fence (woven) which Carol had started some years ago before as an experiment to see if maple saplings could be used instead of willow.

Carol's research into the knot garden idea was exhaustive. She decided on "the Endless Knot of Love," which dated from the Tudor period in England. The design would be composed of four shades of green—wild thyme (*Thymus serpyllum*), catnip (*Nepeta fassenii*), germander (*Teucrium chamaedrys*) and *Artemesia schmidtiana*. It would



not be a closed knot which would have flowers growing in the center, but rather an open knot in which the contrast and color is supplied by various materials placed on top of the soil. The Savilles decided upon a four color arrangement consisting of black (from coal chips), white (limestone), red-orange (brick shards) and yellow (builder's sand).

The area was carefully leveled and measured off. Then the pattern was carefully laid out in limestone lines according to precise drawings by Brent. Lastly the plants were placed according to the plan. At the back of the bed they planted English box bushes from a friend's garden, and lastly installed the wattle fence.

The Saville's ideas on gardening have changed over the last six years. Carol can't remember when they realized that their kind of gardening was no longer low maintenance. She and Brent spent all of their time outdoors in summer; winter is the time for projects on the house. They refer to their knot garden as "the original high maintenance garden."

By now they have gardened all the way around the house and are back at the herb garden where they started. Are they through? "Until next year," say the Savilles.

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Helen Tower Brunet is a garden writer whose column, Gardening Indoors appears in *Yankee* magazine. She is a frequent contributor to *The New York Times* and has written a book on house plants, *Green Grow Your House Plants*. She gardens in a cold porch, under lights, in a homemade greenhouse and outdoors all summer.



Saucer magnolia *M.X soulangiana* in flower at Laurel Hill.

Laurel Hill Cemetery

by Judith Zuk

Cemeteries have always captured my interest. I am amazed that the basic principle of burying people has created so many distinctive styles of graveyards and tombs throughout the world, and I am fascinated by the human history revealed on carefully carved headstones. My interest has generally been viewed with suspicion by my friends, having grown up in an age when everyone from comedians to respectable authors such as Evelyn Waugh were gleefully satirizing American cemeteries.

A few years ago I was relieved to discover a horticultural reason that lent respectability to my preoccupation—the nineteenth century garden cemetery movement. I was further delighted to find that Philadelphia was a leader in this movement and that Laurel Hill, the second garden cemetery in America, remains as a monument to the horticultural and social trends of Victorian America.

To appreciate the importance of Laurel Hill's establishment it is necessary to know something about the times that created it. By the 1830's people in rapidly growing cities found that traditional burials in churchyards were becoming a problem. These church graveyards were often overcrowded, unkempt, unsanitary and a health hazard. In 1836, following the model set by Boston in locating a major cemetery away from the city, the Laurel Hill Co. under the direction of John Jay Smith began to establish a large, landscaped cemetery outside the city limits, which gave rise to the name of rural or garden cemetery.

For this purpose 32 acres of land, located along the Schuykill River, three miles from the city were purchased—the former country estate of Joseph Simms already planted with fine evergreens and shrubs. Smith, librarian of the Library Company, and an avid horticulturist, selected the site for its commanding views of the countryside, its natural beauty and its good soil. As the first superintendent of the cemetary, he guided the development of the design by architect John Notman, and through his influence the cemetery company set a policy that, "One specimen at least of every valuable tree and shrub which will bear this climate and latitude shall be found in these grounds to form an Arboretum." So, Laurel Hill established its place in Philadelphia's horticultural history with its plant collections.

As a friend of Andrew Jackson Downing, America's first and



photos by Judith Zuk

foremost landscape designer, Smith often wrote to him requesting plants and advice for his pet project. The design of the grounds and plant selection show that Smith was following the current landscape theory set down by Downing in his popular books and his magazine, *The Horticulturist*, Letters between them indicate that Smith occasionally purchased trees from Downing's rare plant nursery, including new plant introductions, questionably hardy plants and fine ornamentals such as Cedar of Lebanon (*Cedrus libani*), hop tree (*Ptelea trifoliata*) and longleaf pine (*Pinus australis*). In fact, the ground were embellished with such a wide array of plants that Downing proclaimed Laurel Hill the "finest arboretum in the country."

Downing was not alone in admiring these horticultural accomplishments, for in 1848 more than 30,000 vistors were recorded at Laurel Hill. This may seem a large number of people, but visitors were not limited to mourners. The Victorian society that created this necropolis did not avoid the fact of death, and casual visits to the cemetery were not unusual. In fact, nineteenth century Americans were as lavish in their confrontation with the deceased as they were with the aspects of their prosperous lives. Fascination with melancholy and rituals associated with death developed almost to the point of absurdity. Mourners would don elaborate black clothing and jewelry reserved for such occasions, drape their homes and businesses with yards of black crepe and travel in stylish carriages adorned with black ostrich plumes. Visits to the cemetery unrelated to funerals were common; people went to contemplate their mortality. The idea of meditating among the tombs seems peculiar in modern times, but the victorians enjoyed it and although the pleasure derived from this act was difficult to define it was said that melancholy, when gently excited, was an agreeable sentiment.

The crowds became so large and the picnickers and strollers were often so jolly that Laurel Hill's managers were forced to issue tickets to lotholders and mourners, admitting the general public at selected times.

why the cemeteries were popular

The popularity of Laurel Hill is explained by more than the Victorian fascination with death though. In the early 19th century, Philadelphia and other large cities lacked public parks as we now know them; Fairmont Park was not established until 1855. So, to escape the heat and hassle of urban life people turned to Laurel Hill for a pleasant Sunday stroll. Three times daily a stage would carry passengers from Philadelphia to the cemetery gates, and in the summer the steamboat between Fairmont and Manayunk would stop at the Laurel Hill landing to let off visitors. The crowds became so large and the

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Laurel Hill Cemetery

continued



Engraving of Laurel Hill Entrance, taken from R. A. Smith's *Guide to Laurel Hill Cemetery Near Philadelphia with Illustrations*. Philadelphia: Sherman, Printer, 1847.



Engraving depicting visitors to Laurel Hill, taken from Smith's guide.



Engraving of the original design of Laurel Hill taken from Smith's guide book.

picnickers and strollers were often so jolly that Laurel Hill's managers were forced to issue tickets to lotholders and mourners, admitting the general public at selected times. This popularity became an important defense for crusaders for public parks, indicating a need by city dwellers for open areas for recreation. By the late 1800's most large cities had set aside land for park use.

Capitalizing on the public's interest, Laurel Hill and other garden cemeteries printed guidebooks to sell to visitors, which included detailed maps, beautiful engravings of noteworthy tombstones and information on important lot-holders. Laurel Hill was unique in including a complete catalog of the plants growing on the grounds, giving both common and botanical names. No doubt visitors to the cemetery would go away with a better appreciation of trees and shrubs, influencing the horticultural trends in the community.

laurel hill today

Although many of the unusual trees planted proved to be not hardy and no longer survive, today's visitor can still go away with an appreciation for landscape and horticultural history. The cemetery, now grown to 100 acres in size, has been engulfed by the city, but still maintains a feeling of isolation. As you enter the gates from the sterile city street you are



White birch in background.

immediately shaded by tall trees. This, the oldest part of the cemetery has many large specimen plants and graves described in old guidebooks. Such is the grave of Joseph S. Lewis, who was chairman of the Watering Committee of Philadelphia when the Schuylkill was damned. He now rests under the shade of an enormous plane tree, overlooking the river where his "grave is fanned by the breezes that swept over the backed water of Fairmont Dam."

A more curious spot is the Amphitheater, found on the slopes facing the Schuylkill River. Here the land has been sculpted into wide grassy terraces with vaults in the retaining walls. It is an intriguing variation on the turf amphitheaters found in some English country estates, a feature of eighteenth century garden design.

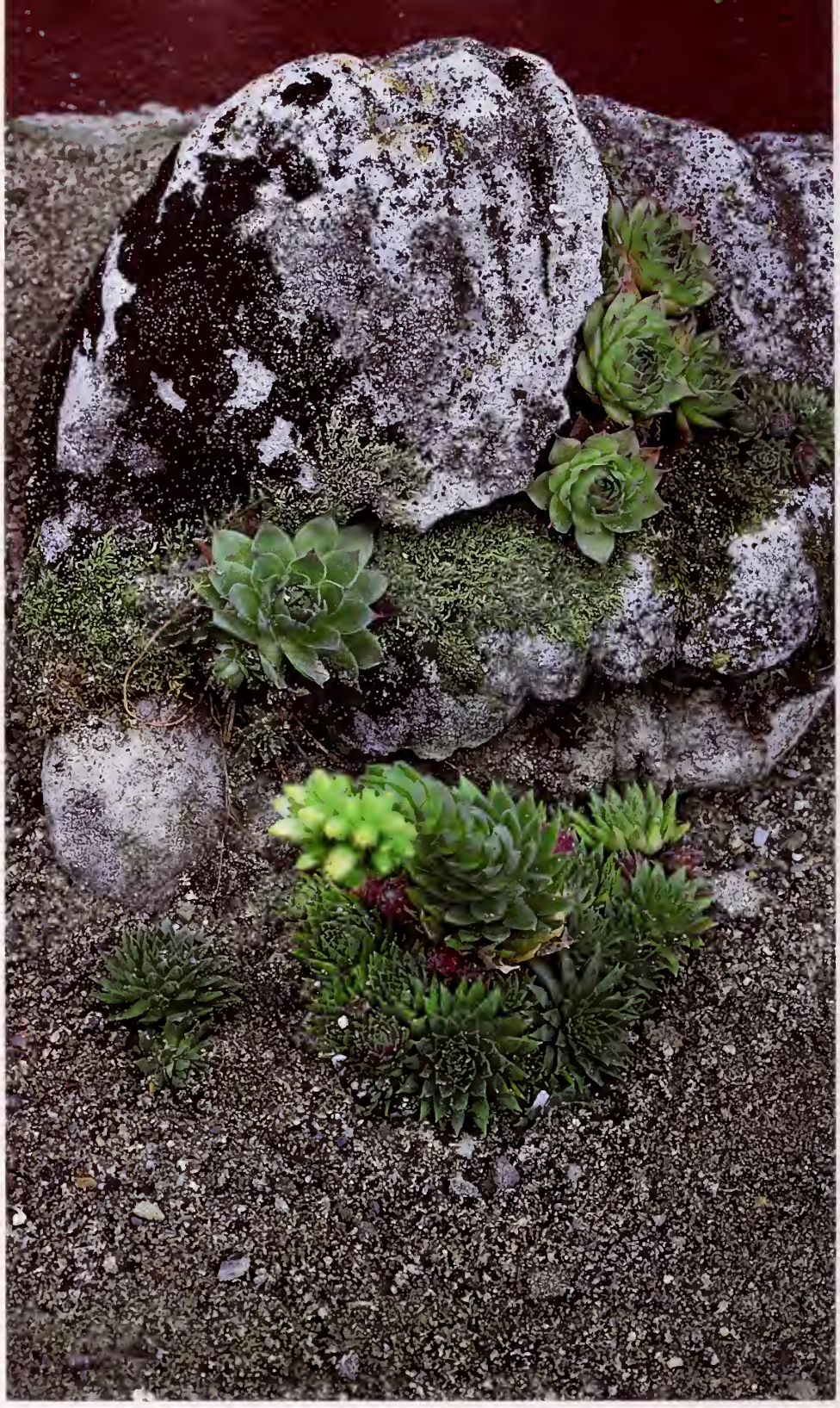
Each area has its own character, all linked together by curving paths once traversed by carriages and strollers. Many areas are domianted by gleaming white obelisks, skillfully carved angels and crosses, and classical style mausoleums, punctured by evergreens, specimen shade and flowering trees. Both the artwork and landscape have been greatly refurbished since I first discovered Laurel Hill five year ago, for concerned art historians and horticulturalists have been working to preserve this bit of Victoriana. Now the charm of the site, its landscape design, and architectural highlights are more easily appreciated.

Each area has its own character, all linked together by curving paths once traversed by people. Unfortunately, over the years volunteer tree seedlings were allowed to grow and mask the cemetery's original design, but under the current guidance of superintendant Peter Kerch, major progress has been made in clearing away unwanted trees and tenacious weeds. The Friends of Laurel Hill are providing funds to add new ornamental trees to the grounds this year, and they have organized spring cleanings to rid the area of litter. Additionally, the Friends have supported efforts to restore the gatehouse, ironwork and headstones, so that both the artwork and the landscape have been greatly refurbished since I first discovered Laurel Hill. Now the charm of the site, its landscape design, and architectural highlights are more easily appreciated.

Where:
Laurel Hill is located at 3822 Ridge Avenue, a short distance from East River Drive. Phone 228-8200. Open daily from 9-5.
Friends of Laurel Hill:
Friends of Laurel Hill receive guided tours of the Cemetery by appointment, genealogical research of Cemetery records and related correspondence, invitations to a variety of activities throughout the year, and a copy of the Cemetery Newsletter. For information about the responsibilities and privileges of becoming a Friend of Laurel Hill write: Friends of Laurel Hill Cemetery, 3822 Ridge Avenue, Philadelphia, Pennsylvania 19132.

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Judy Zuk is the educational coordinator at the Scott Horticultural Foundation of Swarthmore College. She first became interested in Americian garden cemeteries as a graduate student at the University of Delaware in 1975 and has visited their English counterparts while studying horticulture in England in 1976-77.



a sand garden

by F. Gordon Foster



photos by F. Gordon Foster

Sempervivum (photos left and right) commonly known as hen and chickens or house leeks, are classified with descriptive names. Hybridization has caused many variants, which are confusing, inaccurate and meaningless names.

No garden, however small, is without sufficient space for just one more point of interest. Recently I found such a space, ideal in both size and location—a perfect setting for what was to become a sand garden.

While the Japanese influence is dominant in many gardens where sand and gravel are used as a base, I wanted my garden to be original in concept, free of convention and without restriction. Instead of shrines and stone lanterns, driftwood and dwarf evergreens, I would emphasize our county's native, time-eroded limestone rock, upheaved from the ocean floor millions of years ago.

The area selected for my newly conceived garden was a 3ft. by 18 ft. depauperate (exhausted) soil strip between the house and patio. Fully exposed to the unobstructed sun from early morning until mid-afternoon, the temperature seemed to reach that of desert-like intensities.

Preparation of the new area was done with professional help. First, the patio surface, really a jigsaw arrangement of squares and oblongs of blue flagstone, was removed. The soil and rock of both the patio space and garden strip were then dug to a depth of 10 in. The area was then filled and leveled with sharp building sand and the patio stones relaid.

Weathered or horticultural limestone can be expensive, although it is plentiful throughout our country. By dickering with a nearby farmer who was as willing to get the stones off his property as I was to get them for my sand garden, I was able to get selected stones for just about the carting expense.

Arranging the stones on the newly leveled sand presented a pleasant challenge. Sufficient stones artistically placed would add interest; too many stones could cause confusion, ultimately defeating the entire purpose of the project.

With the stones in place, my first choice for a basic planting was the common cactus, *Opuntia compressa*, fully hardy in our subzero winter climate. I transplanted in June, but almost anytime during the active growing season will be all right. As homely as these plants are, they immediately showed a compatible beauty with the antiquity of the deeply pocketed limestone. Stems of these bizarre plants quickly rooted, and beaver-tail blades soon appeared. My reward for selecting and planting these spiny relics of the past came

continued



Opuntia compressa, prickly pear cactus, with its oddly shaped structure, reaches its full glory with its many early summer rose-like flowers.

the following July when each plant was covered with many large, yellow rose-like blooms. After the passing of the flowers, elongated green seed pods appeared, later turning to brilliant red, truly complimenting the spiny green blades.

Subsequently my thoughts turned to a secondary plant, something that would harmonize with the cacti and in time become established both between and on the rocks. Sempervivums have long intrigued me and I felt would be natural candidates. These old-world succulents have common names of "house leeks" or "hen and chickens." The latter name alludes to their vegetative reproduction by offsets or small "chicks" popping out from under the "hen," soon extending themselves and rooting in new areas. Best of all, they are at home in sandy, sunny, and well-drained soil.

Shapes and colors of sempervivums differ greatly: some have tightly arranged leaves forming ball-like clusters; others have coarse, open leaves. Leaves of some species are long tapering, terminating in sharp spines; others are nearly blunt. Leaves may be of solid shades of dull red, grey, blue, green or mixed. Flowers of red, yellow or purple form terminal clusters at the apex of central stalks six or eight inches tall. The blooming period is long and, as the plant dies, the vacant space is quickly claimed by adjacent plants.

Sempervivums are at home on rock and my limestone, with its holes and niches, provided a natural setting. While some plants took hold by forcing them into the crevices, I found that by "ringing" the smaller ones with pebbles they would not wash away before rooting. In some cases, where more gripping was required, I used a fine wire or nylon thread to tie them in place until rooted. As a rule, it takes an entire season for them to gain an independent foothold; young "chicks" seem to take care of themselves before long. A particularly interesting species for rock growing is *S. arachnoidum;* this plant is covered with a network of white hairs.

Each spring I plant our small potted house cacti in some of the remaining open spaces among the opuntias and sempervivums. With pieces of *Saguaro* as a background, they enjoy desert-like conditions for the summer season, but are returned to their respective windowsills for the winter months.

While a garden unique in concept and design has been paramount in my mind, the thought of low maintenance is ever present. Both the cacti and semipervivums seem content in our unusually wide climatic range, and require little care.

There are many other plants that would grow under these conditions but further planting would cause crowding and confusion. Simplicity is the keynote of the best garden design and that is the way I wish to have my sand garden remain.

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F. Gordon Foster is honorary curator of ferns for Brooklyn Botanic Garden; honorary fern horticulturist for New York Botanical Garden and honorary member of American Fern Society. He won the 1978 PHS Distinguished Achievement Medal. Foster's book, *Ferns to Know and Grow,* now published by Elsevier-Dutton Publishing Co., New York was reissued in the second edition in 1976.



Formerly a hodge podge of plants, the strip between the author's patio and house foundation, has become a sand garden composed of succulent plants arranged in a setting of native limestone rocks.

HINDSIGHT ON THE DROUGHT AND ORNAMENTAL WOODY PLANTS

by Paul N. Reber

As I write this in February I know that in May howls of anguish will still be rolling across hill and dale for the ornamental woody plants that did not make it through the winter.

Why, you ask, are only certain plants affected? How could the damage been avoided?

Let's turn the calendar back to last fall when many plants, having struggled through a dry summer, were preparing for a winter rest. That is except for the evergreens whose life processes actively continue 365 days a year. And there is the crux to the problem. You can only go to the reservoir so often before it needs replenishing.

In the case of the evergreens, internal water storage was insufficient when soil moisture was immobilized by cold temperatures. Yet evaporation continued from the foliage surface, more so on broadleaf plants than needled evergreens. Drying winds only hastened the transpiration.

As cells in the leaf dry up marginal browning develops, sometimes penetrating into half of the leaf where the demarcation zone between living and dead tissues is quite apparent. I have observed that most cellular death starts from the plant tip and moves towards the stem end rather than the reverse.

Variations in the severity of damage are seen on rhododendrons, mountain laurel, leucothoe, azaleas, hollies and other large broadleaf plants. Where only leaf portions are affected recovery can be expected. Branches with drooped, curled and browned-off leaves plus discolored flower and leaf buds are questionable.

Why me? Why must my plants suffer while similar specimens down the street look so good?

On the small-leafed evergreens such as hollies and boxwood straw-colored foliage signals desiccation. With needled plants a yellowish green color is followed by brown foliage, sometimes starting at the bottom and on the older inside needles.

Water depletion is not the only factor that plays havoc with winter survival. Take for example the long needled red and Austrian pines. Their mere presence in a heavy, poorly drained clay soil for any length of time is a miracle in southeast Pennsylvania. Sure, they will grow for awhile until something like a 1980-81 growing season assaults them. Even as of this writing Mother Nature is thinning out individual plants in a stand while the better adapted white pine remains green.

If plant species are on the borderline of hardiness low temperatures alone can kill. Stress from heavy, wet snow bending branches will make small cracks under the bark, almost overlooked until examined closely. This particular damage is frustrating to diagnose since the results may not show up for months.

Another weather related injury is quick freeze. This sudden temperature drop normally occurs as an early fall frost or a late frost in spring. Basal rupturing of the bark at the soil line is most common in multi-stemmed plants rather than single trunk trees. It is all too common, however, on ornamental cherries where split bark can be found on limbs and trunk.

Why me? Why must my plants suffer while similar specimens down the street look so good? Ah, but wait. Did your neighbor water those plants deeply in the fall and apply three or four inches of mulch around them? And did that same person use burlap screening to break the wind's force, substituting the unsightliness of burlap for protection.

There are other possibilities,too. One is age. It has been my experience that the newer and older plants are more prone to weather injury—the recently planted due to inadequate root systems and the older ones from lack of attentiveness by the owner.

continued

photos by Paul Reber



Winter injured leaves on Nellie Stevens holly.



New growth amidst the injured leaves.

Besides mechanical barriers to reduce wind velocity we have the anti-dessicants which, when sprayed on the foliage, reduce water transpiration. The effect of one spray lasts about four to six weeks. Two or three applications applied in late winter when temperatures are above freezing will suffice.

Last fall you had a living plant that saw hard times. I hope that a waiting period for recovery growth was allowed before that last pruning cut—right at the soil line. Dormant leaf buds can be stubborn about dying! Many times the foliage will be dessicated but the buds, still viable, will burst forth into leaves if branches and roots have not been severly injured. I find a fingernail to be a good piece of testing equipment. A small scratch on the bark will reveal either light greenish living tissue or tan dead material. If tan then pruning shears can be used to find where the living portions begin.

With the growing season in full swing as you read this article give those winter damaged plants your full attention. Encourage recovery through mulching, watering, where possible, and fertilization.

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A graduate of Penn State University in horticulture Paul Reber has been with the Cooperative Extension Service for 23 years. He works closely with 4-H clubs, garden centers, commercial vegetable growers, homeowners and many other horticulturally related groups in Montgomery County, Pa.



Hybrid Deciduous Azaleas in the Delaware Valley

by David L. Tyler

One day late in May about 20 years ago a friend stopped by with a gift, a small shrub. She said it had just finished blooming and that its flowers had been a beautiful orange color. She couldn't identify the plant. I was delighted with the gift; it was the beginning of many years of acquiring, growing, propagating and studying a subgroup of the rhododendron family.

The following spring, early in May, the shrub came into bloom. There was a truss of ten flowers each about 1½" in diameter, bright orange shading down the corolla to a darker red-orange at the base. The truss started to open from the outer flowers and the unopened buds, standing upright, in the center were a dark red-orange. I saw, in effect, three distinct shades of the orange color. Against the background of the lawn and the green of other shrubs the appearance was startling, especially since the violent color of the spring bulbs had faded.

I wanted to identify the gift I'd received. I searched all listings trying to match my shrub with a name. Mine was so beautiful I couldn't bring myself to accept it as an accident. My search was unsuccessful. After two or three years had passed and other varieties (named and unnamed) came into bloom I realized that my gift needed no name. It was fully acceptable in its own right and no named hybrid could claim a clear and distinct superiority. I find the same to be true today. Many of the unnamed hybrid seedlings are just as attractive as named varieties and also less expensive.

Today that gift shrub is five feet tall and about four feet in diameter at the top. It has five separate trunks, each about an inch in diameter. From its canopy-like top every terminal opens into a flowering truss each year. The original gift has been joined by 50 other named and unnamed varieties to give us a blast of violent color between the fading of the spring bulbs and the arrival of the iris, peonies and other spring perennials. While the blooming period varies by a week or so from year to year, it remains in the same relation to our other flowering plants. The color range of the hybrids are in all shades of reds, yellows and white. All have the characteristic azalea "blotch" of another color which accentuates the beauty of the flowers. In addition, there are varieties with ruffled edges on the petals, doubles, some are fragrant with a honey-suckle like odor. The tubelike corolla may be short or elongated. The stamens, which are usually red on some varieties, may curve outward beyond the petals. There are usually five stamens each of different lengths. It is these genetic identities that make the shrubs so attractive in flower. Most varieties are reliably hardy in the Delaware Valley. They will withstand winter temperatures to 20° below zero without killing the flower buds unless they are exposed to winter wind and full winter sun.

when to select

These descriptions of variety of color, flower shape and form suggest that the time to make your selection is when they are in bloom. Contact

continued

The History

The history of these hybrids began around 1820 when European horticulturists, among them a Belgian baker living in Ghent, obtained seed of our native American species—calendulaceum, nudiflorum, viscosum and others. Crosses were made in some cases incorporating the European species *Rhodendron luteum*. Because so many crosses were made and the hybridizing was so easy to accomplish the exact parentage of most named varieties is unknown. Rather the deciduous hybrids are referred to by a group name:

Ghent: After the name of the city where P. Mortier, the Belgian Baker, lived. Other hybridists continued to introduce named varieties for many years. Reference to the group name has been discontinued in naming new varieties.

Knaphill: After the name of the English nursery owned by Anthony Waterer who began hybridizing around 1870. New offerings of this group continue to be imported to our country almost every year.

Exbury or Rothschild: After Baron L. de Rothschild who secured some of the Knaphill hybrids circa 1922 and applied his genius and finances to further improve many of the previously developed hybrids. Exbury is the name of the Rothschild estate in England.

Ilam: Edgar Stead of Christchurch, New Zealand used Knaphill stock and did further hybridizing. Ilam is the name of his estate in New Zealand.

There are other hybrid groups but they are little known and generally unavailable commercially in this country. Named varieties from the above groups are offered by many nurseries and rhododendron specialists.

The appeal of many of these hybrid deciduous azaleas is demonstrated by the Daviesi and Narcissiflora. They were introduced 150 years ago in the original Ghent group and are still standard offerings through many nurseries.

your favorite local nurseries and nearby specialists. Some local sources are listed at the end of this article; you can order catalogs from the firms listed, also check Franklin West's article, "Azaleas in the Delaware Valley." (*Green Scene*, March, 1974) Most catalogs include color photographs of the named varieties that are considered outstanding. In almost all cases their photos are confined to close-ups of the blooming trusses.

If your purchase is made by mail, specify April delivery. You should receive a blooming size plant with flower buds ready to open. Standard azalea planting instructions apply.

A five foot shrub will be rather bare from ground level to about three feet up. Above that they branch out into a canopy-like top. Each terminal grows to assure itself maximum exposure to sun and light. In spring the flower bud opens shortly after the new leaf buds appear. Additional leaf buds will grow from second and third year wood down to the woody stem from the terminal rosette. These will develop into flowering terminals if good culture prevails and if they get enough sun. This growth pattern provides a plus for the gardener on an average sized suburban property because underplanting permits maximum use of the space available. Proper placement of low and medium height early blooming perennials will give added color at the same time or shortly after the shrub blooms. Perennial candytuft (*Iberis sempervirens)* gives a dense covering about nine inches high, studded with white flowers. Basket of gold (*Alyssum saxatile*), also a perennial, grows about a foot high. Its grayish foliage provides an undercover of bright lemon yellow flowers. Bleeding heart *(Dicentra spectabilis)* grows about 15 in. high and provides a pink spike of flowers rising above a dense lacy light green foliage. On the other hand, some deciduous azaleas of dense and spreading, rather than upright, habit of growth make excellent single specimens. We have several varieties, which even during the winter when they are bare of leaves, exhibit a strikingly beautiful structure.

For a spectacular display of color, if you have the space, use three or five named hybrids clustered in a group. Allow about three to four feet between shrubs for future growth. This will give an outstanding display of color at flowering time.

The cultural objective of the gardener is to ensure a flower on every terminal. This can be accomplished most of the time by following a few special chores. Most important is to remember that the new flower buds for next year are set in 30 to 40 days immediately following the fading of the current year's flowers. There must be ample water and fertilizer available during this period. A week or so without spring rains will not seriously damage any young plants but may prevent the formation of the maximum number of flower buds; remember that the deciduous azaleas are shallow rooted shrubs like other azaleas. However, the evergreen types set flower buds later in the season and over a longer period of time. Early April is the time to apply fertilizer. I use dry organic Hollytone or Espoma or other similar acid type fertilizer to which I add superphosphate. A handful of each, scattered in broadcast fashion about a foot from where the trunks emerge from the ground, will supply the year's needs. Additionally, the flowering stems form seed pods, which use energy from the plant at the time the new flower buds are forming. The stubs of the faded trusses should be broken off (deadheaded) soon after the flowers fade. Perhaps you want to try propagation from seed, if so, then wait for several weeks and select one or two of the largest seed pods and remove the rest. You may lose a bloom on this terminal the following year. The process of deadheading concentrates the strength of the shrub into flower bud production.

The leaves take on all the glow and color of other deciduous trees and shrubs. In a way they appear to be miniature maples seeking to color the garden with reds, oranges and yellow that their larger counterparts display.

The terminal flower bud is always surrounded by three to five leaf buds, which are much smaller and located just below the flower bud which is in the center of the terminal. Since both types of buds open at nearly the same time the flowering and growth process seems to require most of the energy the shrub now has, hence very few if any of the many dormant buds on the older wood will develop at this time. The buds are then ready to come into growth.

The natural enlargement of the shrub comes in the form of new strong stems from ground level. Some of these will attain as much as a foot of growth in a season. They will harden off in winter and will be topped with terminal leaf buds or possibly a flower bud.

While many members of the Rhododenron family seek maximum light without direct sun this is not true of the deciduous hybrids. Mine thrive on three to five hours of full sun during the summer months. They need ample oak leaf or other mulch (not peat moss) and occasional waterings, because of the shallow root system, if the leaves begin to droop.

I protect the life of some of my favorite flowers from the sun by transplanting fully budded shrubs in early spring before any new growth appears. I select a site that is shaded and prepare the planting area. The root ball of these hybrids is small and shallow. A spade depth circling the trunks about 12 inches in diameter is sufficient for a four stemmed shrub. I insert the spade underneath to make sure the root ball is completely loosened. Now I lift the shrub at ground level by the trunks and carry it to the newly prepared site. The root system is tightly compacted and dense so I don't ordinarily use burlap.

When the blooming period is over I disbud and place the shrubs back in either the original growing spot or some other appropriate place. Since I only move about five or six of the 50 shrubs on the property, this is not an undue amount of work, but I suspect this procedure would not be to everyone's liking.

the high cost of some shrubs

The relatively high cost of blooming size shrubs is due primarily



photo by Walter Kern

Kern's Pride



photo by Baldsiefen Nursery

Klondyke



photo by Walter Kern

Kern's garden in May

to the difficulties of commercial propagation. There are two methods of simple propagation available to the home gardener. Propagation by seed (see *Green Scene* Nov. 1980), provides the greatest number and variety of plants. However, special protection during the first winter to keep the ground temperatures above 20 degrees at all times is necessary. Lower temperature will cause bark split at the ground level. The outer growing layers of the stem will separate from the inner woody growth and destroy the young seedlings. Success through the first winter will provide a blooming size in four years.

Ground layering is simple and a successful layer will bloom in the second spring after rooting. Usually only a limited number of branches are available to layer and they will produce identical to the parent. Start by selecting any branch or branches near the ground. Azalea wood is very brittle. Carefully and slowly bend the branch down to the ground so that four to six inches of the bare branch is in contact with the soil. Remove a shallow plug (about two inches) of soil and replace it with pure Canadian peat. Don't mix it in, just lay it in the trench. Pin the branch down with a forked stick and be sure that the peat moss covers the branch. Lay a flat stone over the branch leaving the growing leaves in the open. Keep the area damp throughout the summer and into the early fall. Leaves around the stone will help preserve moisture and the layer should be in place by early May.

Authorities advocate a slit on the branch on the underside with a small stick to hold the slit open; they also recommend dusting the slit area with a hormone. My experience is that most named and unnamed varieties will root without these extra two steps. Other varieties will not root by ground layering at all.

The following spring, after growth has started, raise the stone and gently tug to see if roots have formed. The stone covering must remain in place until rooting takes place. It may not occur until the second year. The ground must not dry out until the successful layer is transplanted. When the root system holds securely, cut the layer from the parent plant and replace the stone. Let the new shrub continue to grow without disturbance until fall. In mid-September transplant the rooted plant

continued

Hybrid Deciduous Azaleas continued

in a prepared place where it will continue to grow on its own.

pests

Few pests bother the deciduous azaleas. The most serious in the Delaware Valley is the Rhododendron borer. Eggs are laid by the female who pierces the trunk a foot or so from the ground level. The emerging grub feeds on the inner growing layer of plant tissue girdling and expanding the feeding area until the trunk is killed. Look for a sawdust-like excrement that exudes from a hole in the lower trunk. For control, squeeze some lindane paste (available at garden centers) into the hole. Another rhododendron pest, the stem borer lays eggs in a crotch or fork of branches. The hatching grub eats its ways down the woody stem and the sawdust-like excrement is the telltale evidence of its presence. Treatment is the same. Both of these pests can be controlled by a regular program of spraying all woody areas of the shrub early in April with a lindane solution. Be sure to cover all wood. Good cultural practices will control other pests. Japanese beetles will riddle the foliage during the summer if allowed to feed freely. They do no permanent damage but do ruin the fall foilage display. Spraying or dusting with Sevin is a positive control for these pests.

The fall season brings another plus for the garden containing deciduous azaleas. As day length shortens and colder air comes in the leaves take on all the glow and color of other deciduous trees and shrubs. In a way they appear to be miniature maples seeking to color the garden with reds, oranges and yellows that their larger counterparts display. As fall progresses all of the leaves fall leaving only the terminal bud, about the size of the end of your little finger. This bud holds the promise of another spectacular display of color next May.

●

David L. Tyler's main gardening interests are azaleas and dwarf rhododendrons.

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Getting Started with Rhododendrons and Azaleas
J. Harold-Clarke
Doubleday & Co., N.Y. 1960.
Excellent for basic information and background. Good lists and excellent descriptions of named varieties available at time of publication.

Rhododendrons and Azaleas
Sunset Books.
A truly excellent and inexpensive book on the species. Complete coverage and a broad and comprehensive list of hybrids by name, season of bloom and characteristics.

These books are available in the PHS library. In addition the library has a file of cultural folders and other information about hybrid deciduous azaleas.

A SHORT LISTING OF NAMED HYBRIDS

The named varieties listed here have been chosen with regard to availability and excellence of qualities. There are probably 200 registered names of the various hybrids, of these some 25 to 50 are readily available in the U.S. from a combination of local sources and specialists. However, the listing here will give you a choice in the color range available and all will be spectacular in bloom. I have excluded the group known as Mollis hybrids because of inconsistent results in the Delaware Valley. They don't seem to thrive here.

Blooming will vary during a two to three week period from about May 5 to May 20.

Codes: Gh (Ghent); Kn (Knaphill); Ex (Exbury). Knaphill parentage improved by Rothschild using ruthless selection of seedlings at Exbury Gardens:

WHITE

*Daviesi (Gh)— White with a light yellowish throat 5-8 medium sized flowers, very fragrant. Beautiful bluish green foliage. Late flowering.

*Oxydol (Ex)— Larger flowers than Daviesii, no fragrance, absence of distinctive foliage color, 8-12 flowers per truss. Rated superior by Exbury.

Fawley (Ex)— White with delicate pink flush fading to white as blooms age. Late blooming. Large flowers 8-12 flowers per truss.

YELLOW

*George Reynolds (Ex)— Buttery yellow, greenish at throat. Large flowers 9-12 flowers per truss. Tall growing, Mid season. Rated superior by Exbury.

*Narcissiflora (Gh) Double chrome yellow, rather small flowers 5-8 per truss. Very fragrant. Mid season.

Golden Dream (Ex) Strong yellow with orange blotch, 9-12 flowers per truss.

Klondyke (Ex) Darker yellow than G. Reynolds large truss and flowers 11-14 per truss. Spectacular display.

Goldfinch (Kn) Chrome yellow with buttercup yellow blotch and a tinge of orange. Tall to 6' spreading. Late flowering.

ORANGE

*Gibraltar (Ex) Coppery buds open to a reddish orange with a darker orange throat. Large truss of 11-14 flowers Truly spectacular in bloom. Excellent fall foliage color.

*Ginger (Ex) Orange carmine buds open to orange with pink shadings. Large flowers 11-14 to truss. Slow to reach full blooming potential. Rated superior by Exbury.

*Coccinea speciosa (Gh) Orange with yellow flush very large flowers and 11-14 flowers per truss. To 4', late blooming. Excellent fall foliage color. This hybrid is 150 years old and still one of the best.

*Eisenhower (Ex) Dark orange almost on red but orange blotch diffuses the red to an overall dark orange. Large truss. Rated superior by Exbury.

PINK

*Berry Rose (Ex) Rose with a yellow splash Large truss 11-14 flowers flat faced flower. Med. height 4-5 ft. Beautiful fall foliage color.

Honeysuckle (Ex) Flesh pink with orange flare. Med. ht 4-5 ft. Excellent fall foliage.

Corneille (Gh) Double flowered pink. Featured April '75 Am. Rh. Soc. issue including color photo. Excellent fall color.

Homebush (Kn) Rosy-pink semi-double. Large trusses 11-14 flowers. Popular in Del. Valley.

RED

*Balzac (Ex) Brilliant fiery red with orange flush. Fragrant, med. height 4-5 ft. Large truss 9-14 flowers. Excellent fall color. Rated superior by Exbury.

Royal Lodge (Ex) Bright red, long corolla 6-9 flowers per truss. Excellent fall color. Not a heavy bloomer.

*Scarlet Pimpernel (Ex) Obviously red. Rated superior by Exbury.

*rated superior.

You Can't Always Believe What the Experts Tell You

by Amalie Adler Ascher



photo by Ellis Malashuk

Calamondin orange (X *Citrofortunella mitis*)

A few years back, on the very day after I had performed surgery on a small Calamondin orange tree to shape it into a bonsai, I read a garden column in which a leading horticultural expert averred that to prune this plant was to prevent its ever blooming again. I was dismayed.

Aside from the fact that fruit is the plant's chief decorative asset (the flavor is very acid), I had a sentimental attachment to this one.

My anguish upon learning that I might have damaged it beyond repair is not hard to understand. But I decided not to pitch the plant, but to sit tight and see what happened. Patience paid off. It finally bloomed, and this past November, I am pleased to report, I noticed it had set six fruits. The lesson: Sometimes benefits accrue as a result of flying in the face of expert prophecy.

In watching my plant closely for signs of bloom and consequent recovery, I also stayed on top of the situation when scale developed, and I was able to deal with it before it took hold. In the process, too, I discovered that a weekly syringing of the plant at

continued

You Can't Always Believe continued

the sink checked emergence of the pest, and summering it outdoors improves its health and hardens its trunk.

My experience led me to develop a skeptical streak. And so it was that I read with reservations an article in the current issue of a popular gardening magazine advocating the training of ivy on the house. It said, "Ivy and other vines on brick or masonry walls will actually help with insulation. In summer the wall surface of a vine-covered sunny area may actually be up to 10° cooler than an exposed wall. In winter the reverse effect is possible. A vine-covered north wall may remain up to 8°F warmer than a bare wall exposed to the north wind.

Maybe so, but at what expense? As one who has grown ivy on the house for some 20 years, I can tell you that modifying temperatures is only half the story. Neatly trimmed vines adorning a brick wall elicit admiration; regret comes later. As growth creeps up the corners and lower facade, the home owner notes with satisfaction the effect of the lush green foliage against the red brick. But when vines reach second and third story levels and begin covering the windows and screens and assaulting the chimney, he awakens to the situation with alarm.

Then begins the costly program of maintenance. Unchecked, ivy is so bold as to invade a room, finding its way in through seams in window frames. It can penetrate mortar, clog gutters, drains, downspouts and window wells, and cause extensive damage to slate roofs. Even after clipping, it doesn't stay put for very long, and at the very least, needs attention once a year.

Moreover, ivy on the house attracts plant lice, or aphids to be more exact, which must be sprayed if the population increases to annoying proportions.And should you decide to throw in the towel and pull the ivy down (in my case, I was obliged to remove dead vines because a dog searching for bones severed the roots), you will find your troubles far from over. Aside from the nasty mess left by the debris, ivy vines mar the face of a building with a network of scars that is virtually impossible to eradicate. Thus my contention that to recommend ivy as a winter money-saver stamps the proponent as either uninformed or irresponsible in failing to divulge the full price.

Ivy on the house attracts plant lice, or aphids to be more exact, which must be sprayed if the population increases to annoying proportions.

In the matter of ground covers, however, I'll take ivy over grass any day. Which brings me to another expert proved wrong. In this case he is a colleague and friend, a syndicated columnist of long standing who, because of my fondness for him, shall remain nameless.

He once paid me a visit in the summer following one of our recent severe winters. The winter had taken its toll on the ivy covering the slopes in front of our house. Many of the bare vines appeared dead. Surveying the scene, my friend remarked that I had better kiss the planting goodby and begin anew. I groaned, but, respecting his opinion, considered taking his advice. Yet the more I thought about digging up the large area and starting from scratch, the less inclined I was to do it.

Then I remembered the words of Henri Schaepman, an ivy specialist from Virginia: "Ivy roots run deep," he once said. Reasoning that I had nothing to lose by waiting. I decided to play it cool and let matters rest. But as I watched for rejuvenation, I helped it along by watering religiously and fertilizing in spring and fall after delicate growth began emerging. I also filled in glaring bare spots with a few new plants.

Except on the lower most portion of one bank, ivy has once again established itself as a thick green carpet, reinforcing my belief that it is folly to accept with blind faith the wisdom of the erudite.

●

Baltimore Sunday Sun garden columnist Amalie Ascher recently received the Garden Writers Association of American Quill & Trowel Communicators Award for her story "For the Retarded Gardening is a Passport to Life." Two of her gardening stories were published in the March issue of *Mechanix Illustrated*, a nationally published magazine.

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What is Killing Hemlocks in the Delaware Valley?

by James J. McKeehen

Canada hemlock, the state tree of Pennsylvania and a common ornamental plant on home properties, is slowly but steadily being eliminated in the Delaware Valley by two insects. Hemlock fiorinia or elongate scale and hemlock wooly adelgid (commonly referred to as the hemlock wooly aphid or chermes) are the two insects infesting more than two-thirds of the hemlocks in some communities.

Unfortunately, unless the homeowner is very observant, the insects' invasion in the early stages is often overlooked. Both insects cause damage by inserting their piercing-sucking mouth parts into the needles and withdrawing vital nutrients. Excessive loss of plant sap reduces the growth and vigor of the hemlock, causing needles to turn yellow and drop prematurely. Observed from a distance, hemlocks heavily infested with either or both insects lose their dark green color and appear a light grey-green and sparse of needles.

The hemlock fiorinia scale is found on the underside of the needles. The hemlock wooly aphid is usually located at the base of the needles and on the bark of twigs near the needles. The wooly aphid appears as small white cottony masses that conceal the females. As opposed to the scale, you can see the wooly aphid by walking up to the tree and looking for the aphid to appear on top of the branches, often only in the lower portion of the tree. The needled branch must be overturned to view the scale. The female fiorinia scale is easily recognized by a flattened, elongated covering, which is brownish-orange and about 1.5 millimeters in length. The scale covering of the male is slightly smaller and white. These scale insects are very small, and often will be several per needle.

scales

The hemlock fiorinia scales overwinter as adult females. In early spring females deposit eggs beneath their waxy scale covers and may continue to do so through early summer. In three to four weeks, the eggs hatch into nymphs (crawlers), which migrate to newly growing nearby needles. At this stage they are vulnerable to an insecticide. The crawlers settle on the underside of the needle, insert their mouth parts and feed for three to four weeks. Then they molt into the next growth stage and another four weeks are required to complete maturity. The male emerges as a tiny winged insect, mates with the female, and dies. The mated female starts to lay second generation eggs six to eight weeks after mating. Scales from these eggs mature into the over-wintering generation.

Chronologically, a general outline of this scale's complicated life history is as follows:

April—Eggs: 20 to 30 days to hatch into crawlers
May—Crawlers: this stage feeds for 20 to 25 days.
June—About 20 to 30 days required for this stage to mature
Summer—About 60 days are required for females to begin laying eggs.
Fall and Winter—Adults are present.

The control of this pest is extremely difficult since all stages of development may be present during the entire growing season. Since the majority of crawlers are present during mid to late May, they should be treated with pesticides at this time. Dimethoate (Cygon 2E) is recommended at the rate of two tablespoons per three gallons of water. A second spray may be applied in early July if needed. Repeat sprays may be applied at seven to ten day intervals. Hemlock fiorinia or elongate scale also infests Carolina and Japanese hemlocks, as well as fir and spruce. However, these are only secondary hosts and if infested, are usually adjacent to infested hemlocks.

hemlock wooly aphids

The most obvious evidence of a hemlock wooly adelgid population is the copious masses of white filaments of wax produced by the females. These cottony masses normally persist throughout the year even after the insects are controlled.



Hemlock fiornia or elongate scale on underside of needles. Notice the number of scales per needle as well as the presence of both female (brown) and male (white) scales.



Hemlock wooly adelgid (aphid) cottony masses on upperside of needles.

The overwintering females are black, oval, soft bodied and about two mm. long and are concealed under their characteristic white cottony mass. They begin to lay eggs in large clusters in the cottony mass during warm weather in late winter and early spring and continue into June. The eggs start to hatch in early April and, depending on

continued

What is Killing Hemlocks continued

temperatures, are usually all hatched by late June. At this time insecticides will provide moderate control.

The newly-hatched nymphs (crawlers) are reddish-brown with a small white fringe near the front. The settled crawler is about 0.3 mm. long, black with white fringe around the body and down the back. They continue to increase in size with active feeding and become mature by late September and pass the winter on the trees as mature females.

The most effective time to control hemlock wooly adelgids is late September and early October. Sprays are directed against overwintering females. The second most effective time to spray is the end of June against the developing nymphs. Where heavy infestations exist, sprays in late June and late September or early October should be considered.

Products labeled for control include: Diazinon 4E, Diazinon AG500, Diazinon 50 WP and Spectracide Insect and Garden Control, a 25% emulsifiable concentrate (a liquid).

Hemlock fiorinia scale and hemlock wooly adelgid are major pests in much of the Delaware Valley. Several years ago, the scale was causing most of the damage. In 1980, the wooly adelgid population increased dramatically and became the prime concern. In some areas where the Canada hemlocks have not been sprayed both young and older trees have been severely weakened or killed. In some communities, I have observed by random counts through the car windshield at least two-thirds of the trees near the streets infested with one or both insects. It is quite common to discover both insects infesting a tree.

Natural predators of these insects do exist, but it is obvious at this time they are not resolving the problem. The only logical way to protect valuable landscape hemlocks is to spray. In some communities neighbors have banded together and contracted with an arborist to spray their trees on a group basis. It is important to know spraying is usually necessary for several years, and even then complete control is often difficult to obtain. Badly infested trees, or trees of questionable importance to the landscape design, may best be removed rather than undertaking a costly prolonged spraying program. The homeowner can often spray small trees, but it is unusual for homeowners to have the necessary high-powered sprayers needed to spray trees 20 to 75 feet or higher. It cannot be emphasized too much: before using any pesticide read the label and follow all directions. All pesticide labels contain information on phytotoxicity, host plants, clearance, safety precautions and dosage information. The insecticides recommended are *not* restricted use products. Both can be obtained without a pesticide applicator's license. Pesticides are poisonous. Please store leftovers in the *original labeled container* out of reach of children, pets and livestock. Rinse and drain empty containers at least four times (more than 95% of the product residue will be removed by this procedure). If they are rinsed as carefully as instructed, they can be disposed of with routine trash. Do not contaminate streams, ponds, or other water sources.

I am saddened to write about this plight of Canada hemlock. These trees have always been among my favorites. I have observed their decline for more than 10 years. During the past three or four years, whenever I have had the opportunity, I have discouraged planting Canada hemlock because of these two insect pests. Unfortunately, the future of Canada hemlock in the Delaware Valley is dim.

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James J. McKeehan is the Delaware County agricultural agent for the Cooperative Extension Service, College of Agriculture, Pennsylvania State University.

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Opuntia compressa. **See page 22**



A vegetable centerpiece created by Ed Lindemann. See article on page 13.

All about vegetables

THE
green scene
HORTICULTURE IN THE DELAWARE VALLEY
JULY • AUGUST 1981 $1.50



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THE
green scene
HORTICULTURE IN THE DELAWARE VALLEY

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Front cover: A nest of kale leaves holds a mass arrangement of cauliflower, sweet, hot and bell peppers, okra, tomatoes and parsley. This centerpiece tempts the diner's appetite. Each vegetable in the arrangement was fitted with an artificial wooden stem that is inserted into oasis in the container. Sprigs of parsley fill the gaps.
photo by Edmund B. Gilchrist, Jr.

Back cover: Lynn Kippax vegetable garden in April.
photo by Jeff Kippax

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DESIGNING A VEGETABLE GARDEN TO SAVE SPACE, TIME AND ENERGY

by Lynn Kippax

An aching back and little available time to maintain a large vegetable garden drove me to redesign and start from scratch. I created three parallel 32 ft. beds in an area that gets plenty of sun all through the day. Two of the beds are seven feet wide, and the middle one is six feet wide (for no reason at all). They are separated by two 32 ft. x 3½ ft. Belgian block paths. Building a Belgian

I try to get as many things to grow up rather than out–except for the root crops. Sugar Snap peas, pole string beans and pole lima beans are marvelous to grow in a small garden.

block path is quite a job–it can also be expensive unless one is lucky enough to have a generous neighbor who supplies the blocks. Brick or flagstone would work just as well but I would not recommend pebbles or crushed stone–they get scattered on the lawn.

Three beds and an adjacent rose garden are framed on two sides by a two foot high yew hedge. A six foot high hemlock hedge to the south and a trio of Scotch pines to the north help reduce the winds and protect crops without blocking sun from the beds. An electrical outlet and underground sprinkler controls have been affixed to the trunk of one of the pines. Dwarf apple, peach, and apricot trees have been successful choices for this small area. Dwarf pear trees are espaliered to both ends of the middle bed. They are eye-catching and even produce fruit.

Beds are edged with old railroad ties. I was grateful for the tip to use old ties because new ones bleed creosote, which is damaging to plants. Raised beds provide good drainage. It is pleasant to sit on these ties and tend the beds

continued



photos by Jeff Kippax in April

Rose garden with chives in foreground – espaliered pear at end of middle bed and "Chinese Ring."

VEGETABLE GARDEN

continued

from each side without having to set foot on the soil–it beats bending, stooping, squatting or kneeling. Blest be the ties I find!

Each year I add compost from our pile to the beds. Surrounded by bricks, stacked in such a way as to permit air to circulate, the compost decomposes into rich humus. Grass clippings are fed onto the pile throughout spring and summer. It also receives all our dry leaves and small twigs, ground by the mulcher or lawnmower with a mulching attachment. Our kitchen provides coffee grounds that are added to egg shells, raw vegetable and fruit scraps ground together in the food processor or blender. This nutritional mess is thrown on the pile daily. Our garbage disposal is underused and the compost matures at a very early age.

Our Buttercrunch, Green Ice, Ruby and Crisp Mint survived the cold better than I and supplied us with salads in January and February.

getting a high yield

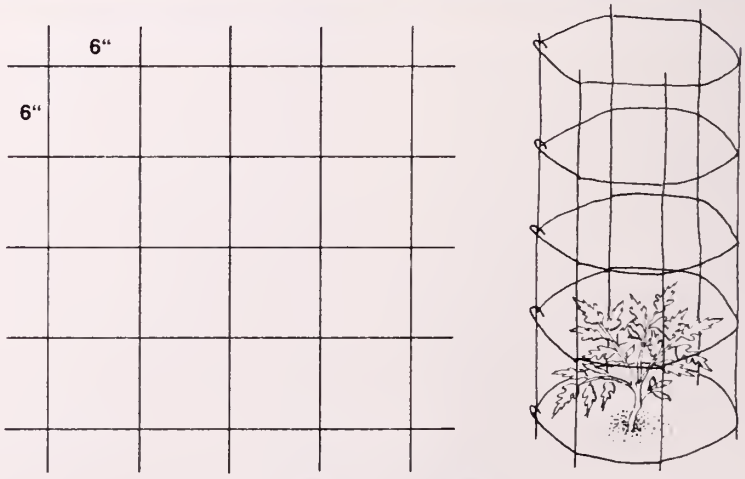
Our goal is to plant as many high yielding vegetables as possible in a small space. I have used the "Chinese Ring" method for growing tomatoes. My ring is four feet in diameter and five feet high. It is made from 5 ft. x 10 ft. metal mats that were originally designed to reinforce poured concrete. A 48 in. x 30 in. "Tomato Guard" is sold specifically for making tomato cages. I prefer the metal mats because the mesh is 6 in. x 6 in. rather than 4 in. x 6 in. in the "Tomato Guard." The mat wire is heavier and it is also easier for me to reach through the mesh to pick fruit that has grown inside the ring. The cage is fastened to metal fence stakes and the entire thing can be moved for crop rotation. The ring can be made to almost any size. Plants are placed around the outside of the circle and tied or poked through the frame as they grow. Compost is tossed inside the ring together with fertilizer and garden weeds. I have been able to grow many more tomatoes in a smaller space using this method. Near the tomatoes I plant basil–good for the cook and bad for the bugs.

Speaking of bugs, I scatter marigold plants through the vegetable garden.

continued



Espaliered pear – lettuce, onions, and marigolds planted closely together in center bed.



Homemade tomato cage



Overall view. Rose bed with chives bloom in foreground.

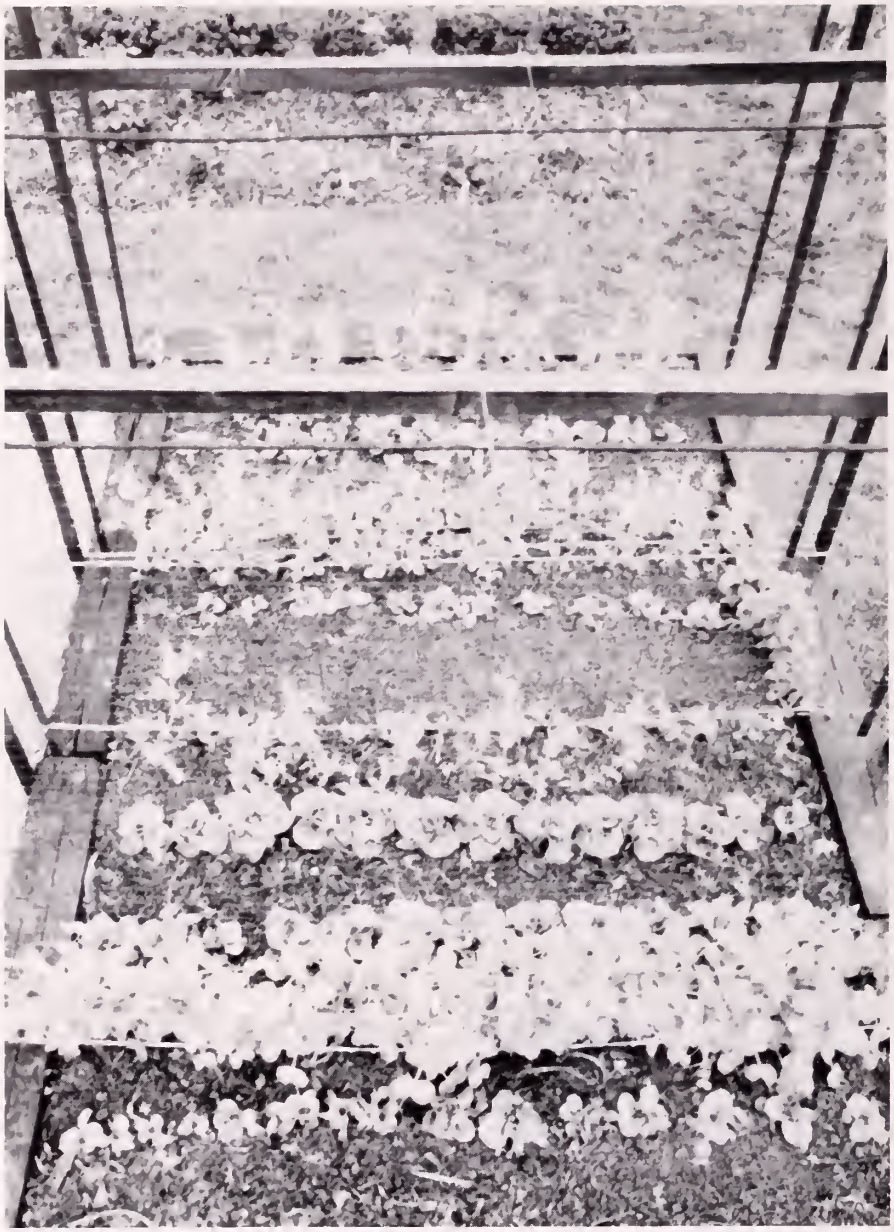
"Chinese Ring" with newly planted tomatoes – compost in center of ring.



They are colorful and help control the nematodes in the soil. A friend suggested that chives, planted in the rose garden, will keep Japanesse beetles from the roses. My chives are quite attractive in among the roses but the beetles, alas, are still there–with bad breath! I have found, however, that clipped chives, spread on the rose bed really do repel earwigs.

I also use the metal mats to make small cages for peppers and eggplant –no stakes are needed and they support the plants beautifully. The bottom ring is cut off with a chain cutter and the 6 in. prongs that remain, when pressed into the ground, are strong enough to keep the cages from falling over. It is easy to cover these cages with burlap in case of unexpected cold weather. It is possible, when cages are used, to place plants closer together than is normally recommended. Straight pieces of mat cut to 18 in. to 24 in. high by 4 ft. or 5 ft. long make a useful temporary fence around the beds–again held in the ground by the 6 in. prongs. Wando and Lincoln peas

continued



Looking down on wooden frames holding nets for peas – lettuce growing between rows.

grow beautifully on these little fences and cucumber do well on them. They take up very little space and help keep a basset hound out of the garden–but not the neighbor's cat.* (One must put up with some inconvenience for free Belgian blocks.)

I try to get as many things to grow up rather than out–except for the root crops. Sugar Snap peas, pole string beans and pole lima beans are marvelous to grow in a small garden. Corn is best bought at farmers' markets. I grow peas and beans on nylon netting held up by homemade wooden frames, bolted to the railroad ties. The frames extend from north to south so that the plants receive maximum sunlight. As with the Chinese Ring, the wooden frames can be moved for crop rotation.

Years ago Fred Wilson, a fine gardener in Swarthmore, introduced me to Dr. Harold Martin lima beans. In April I start these pole beans in our basement under Gro lights with seed that I have saved from the previous year. (The second year a mouse ate my saved beans and Fred kindly replenished my supply.) In mid-May I move the plants outside to the netting. They begin producing beans from early July to the first frost. Four 7 ft. rows keep a small family well supplied. Limas are a wonderful vegetable to grow for freezing and Dr. Martin's beans are the finest we have ever eaten.

When the Sugar Snap peas, which are planted in mid-March, begin to wane I plant pole string beans right next to them. There is plenty of time for the beans to grow and they may use the tired pea vines for added support. Bush beans keep us supplied until these are ready. I plant early lettuce between the pea and bean rows–lettuce plants grow well in light shade and will be eaten before the peas and beans are ready to be picked.

garden lettuce in january and february

Lettuce is one of our favorite crops. I plant nearly a dozen varieties. A lettuce plant can be tucked into a small empty spot–even in the flower garden. Some lettuce is started indoors under lights in February and moved to the garden in late March. We rarely pick the whole plant, just outer leaves–this way we can start picking very early in the season. We enjoy eating garden lettuce most of the year. A coldframe can keep fall-planted lettuce alive throughout the winter. I make temporary coldframes each year from short railroad or garden ties built right over a section of a vegetable bed. There is no need to fasten them together and they're easily dismantled. The thick ties provide marvelous insulation and old storm windows work beautifully as tops for frames. This past winter I spread worn quilts on top of the glass during the very coldest weather –held down by my little metal fences on their sides. Our Buttercrunch, Green Ice, Ruby, and Crisp Mint survived the cold better than I and supplied us with salads in January and February.

I prefer a fall garden to a spring one. In the spring lettuce decreases in vigor as the heat increases. Fall lettuce, sown in August, is beautiful, withstands quite low temperatures, and responds to the cool weather. Most of the troublesome bugs have packed their bags by September and the beets, lettuce, carrots, broccoli, Brussels sprouts and chard have free reign (even in the drought).

Our garden keeps us and our friends well supplied with plenty of wonderful vegetables throughout the year. A similar garden could be made on a different scale–next time I redesign I will make it even smaller.

Lynn Kippax is retired vice-president of American Aniline and Extract Company and is a consultant for Thiokol Corporation. An amateur gardener, he is vice-president of the Associates of the Scott Horticultural Foundation of Swarthmore College.

*A staff member takes care of cats with oil of lemon verbena. He saturates two inch sq. felt pads and staples them to markers. The kits are available from garden centers.

Companion Planting in the Vegetable Garden

by Nancy Putnam Howard

The delights and pleasures of companion planting are immeasurable. You dispense with poisonous sprays and all the nuisance, inconvenience, possibility of skin, throat and bronchial irritation and yet produce high quality and plentiful crops with the best of flavors and a minimum of devastating insects and diseases. With this method of pest control you can walk down your garden path,



pluck and eat right from the vine a tomato, a plump strawberry or a Sugar Snap pea, sunkist and so delicious. No washing or soaking is needed to remove poisonous residues.

not a new idea

Companion planting is not a new idea. Our forefathers successfully did it. Although their garden enclosures were not always large, they grew the necessities in this space: vegetables, fruits, nuts and herbs. The latter not primarily for flavor, but for health, home comforts, and dyes. They made the most of a limited area and interplanting was a way of life. They observed that certain vegetables grew better in proximity with certain other vegetables (and that others did not do as well). They were quick to follow nature's indications. Herbs were grown throughout the gardens and in beds along the sides and ends. In small gardens sometimes everything grew together in happy confusion, but all seemed to prosper.

The compatible vegetables enhanced one another's strength and health so that they were able to resist attacks by insects and diseases. The herbs played their extra role fending off, distracting and repelling injurious insects and diseases with their above ground aromas or through their underground roots. Extraordinarily enough they attracted the beneficial insects such as lady bugs and praying mantises.

If you take this step and try this experiment, do cover your entire garden, whether large or small. To attempt a row or two at one end of the garden or on one side of the path would hardly be a fair trial and would only end in disaster and total frustration.

not too late to begin

Here it is July. Your initial planting is done. Your corn may be knee high and your tomato plants already blooming. Don't despair. It is never too late to begin. In fact the soil is now really warmed up so that the hot weather seeds will germinate in no time. There are still days and weeks to plan and plant for your successive crops this year.

Of importance is what to do now July 1981. The short list on this page might be called an introduction or the 1981 trial. Then you may attack the longer list containing perennials and plan for further development come 1982. Preplanning does pay with rich rewards.

On the list on p. 9, you will notice there are five columns. In columns two and four more than one herb or vegetable is mentioned. It is not necessary, indeed in certain instances it would be inadvisable, to plant all. Here you have a choice. Let your taste, your space and your aesthetic eye firm up your decisions.

continued

Suggested Sample Plantings for Summer of 1981: for more complete listing and benefits see page 9.

Crop Vegetable	Companion Vegetable	Beneficial Herb Annual; easy from seed now
Cucumbers	Radishes. Some in each hill or near each cucumber vine. If you can obtain the black radishes, do plant these. They take longer to mature and thus do their good work for the cucumbers over a longer period.	
Beans	Eggplant, potatoes, beets	Summer savory
Beets	Beans, onions	
Cabbage, Broccoli, etc.	Tomatoes nearby, beets and onions	Nasturiums; surround the plants or put in a row.
Carrots	Lettuce	
Corn	Peas. Plant where the peas are or were growing. Peas bring up nitrogen, which is good for the corn.	
Eggplant	Beans	
Lettuce	Carrots, radishes	
Radishes	Cucumbers, lettuce, peas	Nasturiums
Squash		Nasturiums
Tomatoes	Cabbage, onions, carrots	Calendulas, Sweet basil

Companion Planting

continued



Herb beds, large and small, rows and specimen plants surround the entire vegetable garden.

This is a start for what you may have in the ground or may be planting within the next month to six weeks. You undoubtedly have the vegetable seeds on hand and the herb seeds would be readily available in any of the seed stores or the supermarkets.

Good gardening practices go hand-in-hand with companion planting. Keep your soil in healthy and productive condition. Purchase top quality seeds, insect and disease resistant varieties. Rotate your crops. Keep a clean garden. Do not leave little mounds of weeds along the paths and forget them overnight; put them on the compost pile immediately. In addition to planting summer savory with the beans, keep a watchful eye on your crop. As soon as the peak of production has been reached, pull those plants and compost them. Once they attained this state the plants become weaker and the bean beetles are all ready to move in. You can avoid an infestation by this prompt

continued on p. 10



In the rear, starting at left: tomatoes over horses; continuing left to right: onions, parsley, sweet, small leaf basil; next: nasturtiums (hide onions and parsley) and broccoli; next (beans were pulled): marigolds, swiss chard and *Thymus pulegioides*.

VEGETABLES & HERBS AS COMPANION PLANTS

Crop Vegetable	Companion Veg. or Fruit	Benefit	Companion Herb	Benefit
Asparagus	tomatoes	helps combat asparagus beetle	parsley, basil (sweet)	helps combat asparagus beetle
Beans (bush or pole)	strawberries, cucumbers, corn, potatoes (alternate rows), eggplant (six beans to one egg-plant),celery	compatible	savory, winter/ summer rosemary	helps control bean beetle
	carrots, beets	benefits growth & flavor		
Beets	bush beans, onions, kohlrabi	benefits growth & flavor		
Cabbage Broccoli Kale	tomatoes (nearby)	helps control cabbage fly		
Brussels sprouts, etc.	celery, elderberry (strew branches along the rows)	helps to control cabbage fly, health of crop	hyssop, sage peppermint, rosemary, thyme, southernwood, wormwood, dill	helps control cabbage fly, health of crop
	beets, onions	compatible	chamomile nasturtium	helps prevent cabbage rot helps prevent aphids
Carrot	leaf lettuce, oyster plant			
	peas, leeks, onions, tomatoes	helps control carrot fly	rosemary, sage, wormwood	helps control carrot fly
			chives	promotes growth & flavor
Celery	leeks (alternate rows), tomatoes	promotes growth & flavor		
	bush beans (6 celery to one bean), cauliflower, cabbage	compatible		
Corn	pumpkins, cucumbers, squash	compatible		
	early potatoes pole beans	improves growth & flavor		
	peas, soy beans	add nitrogen to soil and catch plant; helps control Japanese beetle & repels cinch bug.		
Cucumbers	corn, early potatoes, early cabbage	compatible		
	radishes (plants in hills or around plants)	combats cucumber beetle	marigolds	combats cucumber beetle
	kohlrabi, lettuce, beans (border)	compatible		
Eggplant	beans	helps combat Colorado potato beetle		
Leeks	onions, carrots, celery	compatible		
Lettuce	carrots, radishes	these three make a strong combination		
	cucumbers strawberries	benefits growth & flavor		
Onions	beets strawberries tomatoes, lettuce	benefits growth & flavor	chamomile savory, summer	benefits growth & flavor
	carrots	combats onion fly		
Peas	beans, carrots, corn, cucumbers, radishes, turnips	compatible	caraway	compatible
Potatoes	eggplant	helps combat potato beetle	dead nettle (border plant or corners of path)	helps combat potato beetle
	beans	compatible		
	corn, cabbage			
Radishes	cucumbers	compatible	chervil	mutual benefit
	lettuce	tenderizes radishes		
Raspberries			garlic, rue, tansy	helps combat Japanese beetle
Spinach	strawberries	benefits growth & flavor		
Squash	corn, bush beans	compatible	nasturtium	helps control squash bugs
Strawberries	lettuce, spinach	benefits growth & flavor	borage	benefits growth & flavor
			pyrethum	repels insects
Tomatoes	onions, carrots	compatible	chives	compatible
	asparagus, cabbage	helps combat tomato insects	basil, sweet	helps combat tomato insects
			marigolds	benefits growth & production
			parsley, mint (plant near)	benefits growth & flavor
			nasturtium	helps combat white fly
			borage	helps combat tomato worm
Turnips	peas	benefits growth & flavor		

action. Do not plant more beans at a time than you think you can use or easily harvest. Plant smaller quantities more frequently. Keep them coming and keep them under control. Never go near your bean plants nor touch them if they are the slightest bit wet. Rust and failing plants result. Do not plant more beans in the area (row) where you have just pulled them. Choose another location.

Keep an eye on the cabbage butterflies heading for the cabbage plants. Suddenly they will become distracted, head for the hyssop, become utterly confused and forget entirely their original goal.

Cucumbers and squash are two other vegetables that do better if planted in smaller quantities–and more often. At the first sign of the squash borer or the cucumber beetle, pull the vines. Bush squash plants are much easier to handle, especially in a small garden. You do not run the risk of damaging the vines by stepping on them as you harvest nor spreading disease if the vines happen to be damp or wet. Cucumbers grown on netting or turkey wire can be healthier and more resistant to disease than those allowed to run on the ground. Here again, it is a matter of humans or our four-footed friends touching any part of the vines when they are wet.

Right now your garden is young. Give it a chance before deluging it with a spray. Hopefully whitefly has not yet settled in. I have not yet come across a specific companion vegetable or herb that will eradicate whitefly. However, I have discovered that whitefly is more apt to arrive and stay if there is little circulation of air and if plants are planted too closely together. This is particularly true of tomatoes. Once their foliage develops they are heavy, lush plants. Air does not get under and through this denseness; but the whitefly does and considers it the happiest of homes. It takes advantage and multiples horrendously (as you well know). Give your tomato plants plenty of space. Try hosing down the foliage, the upper sides and the under sides, with pure water at the first sign of whitefly.

You have noted in the list that I suggested planting nasturtiums with broccoli, etc. You may say–but the nasturtiums attract aphids. They seem to keep the aphids away from the broccoli and perhaps the broccoli keeps the aphids away from the nasturtiums. In all our years of gardening, only once, perhaps the first year of trying this, did we have aphids on the nasturtiums. Here a hosing of clear water with the hose did the trick. No more aphids.

A final thought: do not panic at the sight of a few insects or a bit of wilt on a perennial plant. Tomato worms are large and they are ugly. However, rarely do they come in hordes and they can be removed easily by hand. You don't have to spray.

Once in a while you will discover a plant acting as a catch plant. Watch carefully and see if this plant is doing all the attracting and in so doing saving other plants around it.

The tables are for next winter's relaxing perusal and planning. May you find them of interest and fun. Some of the perennials you may be able to start from seed this summer–or from a snip-it, layering or division from a friend. You will be ahead of the game in the spring if you are successful.

In 1982 your garden will have a new look–color, texture and aroma. Don't forget to watch for nature's comedy. Keep an eye on the cabbage butterflies heading for the cabbage plants. Suddenly they will become distracted, head for the hyssop, become utterly confused and forget entirely their original goal. One more vegetable saved.

●

Nancy P. Howard is an enthusiastic companion plant vegetable gardener of many years. She is an active member of PHS (past chair of Publications Committee and Council member) and the Herb Society of America. She has contributed to *Green Scene* and the Herb Society's publications.

HELPFUL HERBS

Plant here and there throughout the garden, singly, in groups, as an edging or specimen plant, in peripheral borders, or with specific vegetable as mentioned in list on page 7.

A = Annual B = Biennial P = Perennial

Basil	*Ocimum basilicum* and varieties (A)
Borage	*Borago officinalis* (A)
Caraway	*Carum carvi* (A/B)
Chamomile	*Chamaemelum nobile* (P) or *Matricaria recutita* (A)
Chervil	*Anthriscus cerefolium* (A)
Chives	*Allium schoenoprasum* (P)
Coriander	*Coriandrum sativum* (A)
Dead Nettle	*Lamium album* or *L. maculatum* (P)
Dill	*Anethum graveolens* (A)
Garlic	*Allium sativum* (bulb)
Hyssop	*Hyssopus officinalis*
Lavender	*Lavandula angustifolia* (P) and varieties
Lemon balm	*Melissa officinalis* (P)
Marigolds, pot	*Calendula officinalis* (A)
Marjoram, sweet	*Origanum majorana* (tender perennial)
Mint	*Mentha spicata, x piperita* and varieties (P)
Nasturtium	*Tropaeolum majus* (A)
Parsley	*Petroselinum crispum* (B)
Pyrethrum	*Chrysanthemum cinerariifolium* (P)
Rosemary	*Rosmarinus officinalis* (tender perennial)
Rue	*Ruta graveolens* (P)
Sage	*Salvia officinalis* and varieties (P)
Savory, summer and winter	*Satureja hortensis* (A) and *S. montana* (P)
Southernwood	*Artemisia abrotanum* (P)
Tansy	*Tanacetum vulgare* and varieties (P)
Tarragon, French	*Artemisia dracunculus* var. *sativa* (P)
Thyme	*Thymus vulgaris* and varieties (P)
Valerian	*Valeriana officinalis* (P)
Wormwood	*Artemisia absinthium* (P)
Yarrow	*Achillea millefolium* (P)

Vegetable Trials: *getting the best*

by Lois A. Stringer



photo by Lois A. Stringer

Sharon Watkinson works at the squash trials.

Many people avoid "trials" at all cost. Seedsmen, on the other hand, spend a great deal of creative time and energy on growing trials; vegetable and flower trials that is.

Situated just outside Doylestown, about 25 miles from Philadelphia, is Fordhook Farms. This is the eastern test grounds of the W. Atlee Burpee Co. (Corporate headquarters are at Warminster, Pa.) Fordhook has been in continuous operation since 1888.

Trials are a way of testing new varieties for adaptation to a northeastern climate, checking purity of named varieties, evaluating the potential of experimental lines and observing varieties from other companies. Each year approximately 1,000 to 1,300 vegetable trials, and a like number of flowers, are grown at Fordhook. The data obtained complement results of Burpee's extensive trial and breeding test grounds in California.

The primary purposes of Burpee's trials are to observe potential newcomers for the catalog and provide accurate descriptions for catalog and packet copy. Home garden use is top priority.

Seed samples arrive each winter from various sources. Purity trials come from Burpee's own production fields or wholesale producers from whom seed is purchased. Merit trials are experimental lines from our own plant breeding projects, state or federal experimental stations and domestic and foreign commercial plant breeders. Entries of both vegetables and flowers for the coveted All-America Selections (see box) medals are grown and judged at Fordhook. Occasionally amateur plant breeders will send a selection of special merit. Burpee's Long-Keeper tomato resulted from one such trial.

Trial rows are arranged for convenience in planting, cultivation and uniformity rather than decorative effect. Most vegetables are grown in 30 ft. rows (18 ft. for flowers) in a block pattern.

evaluating a trial; characteristics to look for

Observations begin at the time seedlings emerge from the ground, or in the greenhouse flat. All notable differences and general performance is recorded until the plants reach maturity or are killed by frost. We look at general plant habit, the first and peak harvest, plus amount and duration of harvest; disease resistance or susceptibility; response to environmental stresses, if any; color, size, shape and general appearance of produce and the flavor, aroma, crispness, textures and other eating qualities.

Every class has its own set of required

continued

points of observation. Thirty to fifty different criteria are not uncommon. With corn, for example, some things we will observe are length of the ear, width, depth of the kernel, how hard to snap, and when was it picked.

A careful evaluator avoids decisions on one-time observations and is as objective as possible. Replications, two to three additional plantings grown under varying conditions in the same season, offset possible chance bonanzas or failures. Established varieties are used as comparison checks against which experimental or competitor materials are judged. At the same time the known varieties are evaluated for purity of type as part of an on-going quality control program.

In its ultimate, trial evalution of new varieties is searching for the "ideal" plant. Such a plant might start producing earlier, yield steadily regardless of weather and last until frost; it would fend off all diseases and be totally repellent to insects and other pests; in addition it would look superb and taste delicious. As you see, even this "ideal" plant would be subject to frost damage.

In reality, of course, we look for the best available among new plant developments. They would include the qualities listed in the paragraphs above as well as:

- Increased yields and lasting quality of the produce on and off the plant.
- Uniformity.
- Habit changes such as more compact varieties of vine types or stronger plants from weak types.

pitfalls

What are the pitfalls? There are days when the rain doesn't stop and the fruits rot, or there is no rain and the plants are parched. Or a row almost ready to harvest is attacked by furry or feathered varmints or carried off by two-legged human thieves.

If there are problems is there fun? Yes. It is difficult to measure the satisfaction of creative involvement in observing plants in all their beautiful and useful forms. It is soul-satisfying. No matter how jaded your mind or tired your back in the fall, the first warm spring day sets the senses tingling again.

By the way, a need for help in sampling melons usually elicits the most offers for assistance.

●

Lois A. Stringer is the eastern trials manager at Fordhook Farm. She is a research horticulturist who specializes in squash breeding. She is also part of the team involved with designing and planning W. Atlee Burpee exhibit at the Flower Show.

Fordhook – public tours
(trials are not open)

A small area of colorful and educational vegetable and flower gardens are open to the public. The 1981 dates are August 14, 15, 16 and 21, 22, 23, 9:30 AM to 3:30 PM. For complete information contact W. Atlee Burpee Co., 300 Park Ave., Warminster, Pa. 18974 (Phone 215-674-4900).

OTHER TRIALS:
THE ALL-AMERICA SELECTIONS

The All-America Selections is an educational, nonprofit organization for evaluating new seed-grown flowers and vegetables from around the world. A council of judges made up of eminent horticulturists from the garden seed trade, universities, and public gardens provide the trial grounds and voluntarily conduct the many trials necessary to choose the superior varieties that will be designated "All-America Selections."

Lois Stringer is currently one of the 28 All-America Selections vegetable judges nationwide. Theodore C. Torrey, director of Burpee vegetable research, preceded her.

Burpee has received seven awards for vegetable varieties since AAS started. Five of these are still available: Burpee's varieties of Tenderpod Bean, Early Pimento and Fordhook® Pepper, Zucchini Squash & Jubilee Tomato.

All-America Selections Display Gardens in Areas Served by *Green Scene:*

District of Columbia

U.S. Botanic Gardens
Maryland Avenue, S.W. & 1st Street
Washington, DC 20024

Maryland

Cylburn Wildflower Preserve and Garden Center
4915 Greenspring Avenue
Baltimore, MD 21209

Brookside Gardens
1500 Glenallan Avenue
Wheaton, MD 20902

New Jersey

Hunterdon County Park System Arboretum
R.D. 1 Highway 31
Lebanon, NJ 08833

Ramapo College of New Jersey
505 Ramapo Valley Road
Mahwah, NJ 07430

Deep Cut Park Hort. Center
Red Hill Road
Middletown, NJ 07738

Morris Co. Park Commission
53 Hanover Avenue
Morristown, NJ 07960

Cook College, Rutgers Univ.
Blake Hall, Box 231
New Brunswick, NJ 08903

Skylands Gardens
Ringwood State Park
Box 1304
Ringwood, NJ 07456

Somerset County Park Comm.
P.O. Box 837
Somerville, NJ 08876

New York

Brooklyn Botanic Garden
1000 Washington Avenue
Brooklyn, NY 11225

Arboretum of Greater Buffalo
Forest Lawn Cemetery
1411 Delaware
Buffalo, NY 14209

Sonnenberg Gardens
Entrance on Route 21 North
Canandaigua, NY 14424

Queens Botanical Garden Society, Inc.
43-50 Main Street
Flushing, NY.11355

Mohonk Mountain House
Mountain Rest Road
New Paltz, NY 12561

Green Guerillas
W. 48th between 9 & 10th Sts.
New York, NY 10036

Old Westbury Gardens
70 Old Westbury Road
Old Westbury, NY 11568

Sterling Forest Gardens
Box 608
Tuxedo, NY 10987

Pennsylvania

Longwood Gardens
R.D. 2
Kennett Square, PA 19348

Peddlers Village
Lehaska, PA 18931

Rhode Island

Blithewold Gardens & Arboretum
Ferry Road
Bristol, RI 02809

Virginia

American Horticultural Society
River Farm
7931 East Boulevard Drive
Alexandria, VA 22308

Busch Gardens
P.O. Drawer F.C.
Williamsburg, VA 23185

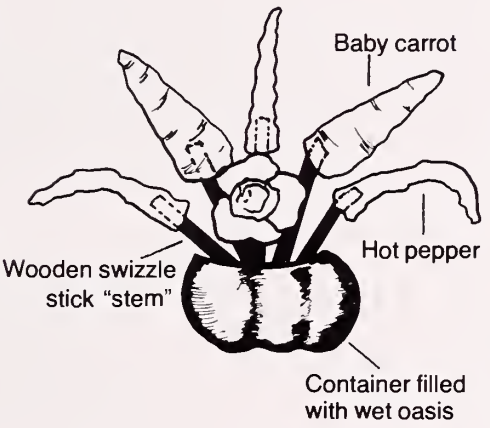
Please Eat the Centerpiece

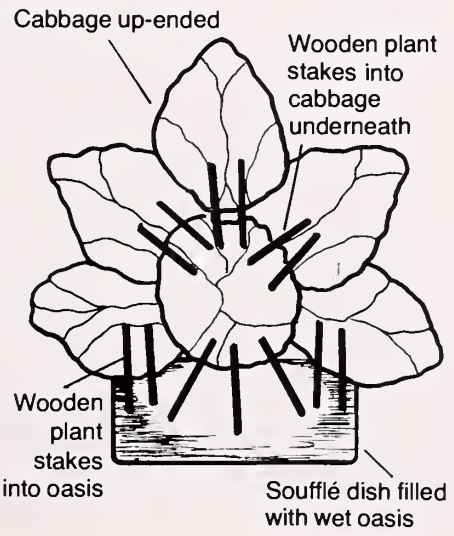
by Ed Lindemann

A few years ago, I became frustrated as I went through the garden looking for some blossoms for a centerpiece in the PHS boardroom. There just wasn't anything substantial enough to work with for the special luncheon. When I saw six heads of flowering kale, I decided to give them a try. It took about 20 minutes of mechanical engineering, but with a large bowl, some plant stakes and lots of false starts a terrific arrangement was on the table. The kale centerpiece caused more comment than any "floral" arrangement I have ever done.

Once you have mastered the mechanics it becomes fun. The two big differences between arranging vegetables and arranging flowers are the lack of vegetable stems and the heavy weight of most of the individual pieces. These problems usually lead me to build pyramid or mound arrngements. I work with the largest and heaviest pieces at the bottom and the smaller, lighter ones at the top. The result is usually good balance, scale, and proportion.

I use wooden plant stakes, thick wooden toothpicks and wooden swizzle sticks to make my own stems and also to attach the various vegetables to each other. Wet oasis is used to fill the container. I anchor the bottom vegetables into the oasis with stakes. Heavy items such as cabbage or cauliflower often require three or four stakes to act as feet to keep them from tipping (see illustration). Parsley is comparable to baby's breath in floral arranging; it fills the gaps and hides any mechanics.





Green onions, asparagus and celery can be used to suggest a stronger design line. I cut the ends of asparagus and celery on a sharp angle and place them directly into the oasis. Insert florist wire into the stem of the green onions for additional support.

Occasionally, I like to mix flowers and vegetables. The herb garden is an excellent source for interesting foliage. The combinations are endless: color, texture and fragrance abound in the vegetable garden. No matter what size your vegetable plot may be there usually comes a time when you have an overabundant harvest. The next time this happens give your imagination free reign and create an arrangement. It is fun to use the same items that you're including in your menu in your centerpiece or to make small individual ones that your guests can take home and enjoy the next day.

The vegetable centerpieces last for several days if kept in a cool area. Tomatoes are the most perishable and often need replacing after one day. Except for the holes made by the stakes, the vegetables are fine and can often still be eaten. I have enjoyed asparagus after it has spent several days in an arrangement proving that you really can eat the centerpiece.

continued



Fresh asparagus, green onions and the Lenten Rose *(Helleborus orientalis)*. With parsley as a filler, this arrangement in a stoneware crock is a monochromatic introduction to a new gardening season. Comfrey leaves from the herb garden give an interesting texture. After three days the asparagus was removed, steamed and enjoyed for dinner.



The tools are few: a pair of shears, scissors and a sharp knife. I like to work where I can spread out. The kitchen sink and counter are perfect. An assortment of wooden stakes and picks is used to build the arrangements. A wooden swizzle stick has been used to create a stem for the pepper on the cutting board. It will then be inserted into the arrangement and secured in the oasis filling the container.





Red and green cabbage is piled high in a soufflé dish. Brussels sprouts, asparagus, broccoli and garlic are fitted in between the cabbage heads. Out of season produce from the market can be combined with harvest from the garden. An arrangement of this size weighs nearly 20 pounds and is best constructed in place.



A small arrangement fills a favorite Chinese soapstone container. Brussels sprouts, baby carrots and tiny hot peppers are used along with tansy from the herb garden. The overall height is approximately 8 in. This arrangement remained fresh for nearly a week. The tansy was replaced every few days.

•

Ed Lindemann is PHS horticulturist and designer of the Philadelphia Flower Show.



Our Horticultural Librarian Recommends

by Mary Lou Wolfe

books

BETTER VEGETABLE GARDENS THE CHINESE WAY
Peter Chan and Spencer Gill. Portland, OR, Graphic Arts Center, 1977.
Detailed account of raised-bed method of vegetable gardening with excellent photographs of techniques from constructing a slug trap to building a bean trellis.

CROCKETT'S VICTORY GARDEN
James Underwood Crockett. Boston, Little, Brown, 1977.
Gardening fundamentals presented in calendar format with generous use of color photos and line drawings.

THE GREEN THUMB BOOK OF FRUIT AND VEGETABLE GARDENING
George Abraham. Englewood Cliffs, NJ, Prentice-Hall, 1970.
Complete information on fruit, berry and nut growing as well as vegetable gardening. Includes troubles and treatments.

GROW YOUR OWN CHINESE VEGETABLES
Geri Harrington. New York, Macmillan, 1978.
Culture and culinary uses of 38 Chinese vegetables including yard-long beans and winter melons. Lists sources for seeds or roots.

ROOT CELLARING
Mike and Nancy Bubel. Emmaus, Rodale Press, 1979.
Inventive, practical suggestions to provide "life after picking." Photos and diagrams of root cellars and interviews with their owners. Authoritative and dependable.

SQUARE FOOT GARDENING
Mel Bartholomew. Emmaus, Rodale Press, 1981.
Space-saving techniques including crop rotation and vertical growing.

SUCCESS WITH SMALL FOOD GARDENS
Louise Riotte. Charlotte, VT, Garden Way, 1977.
Emphasizes special intensive methods and space-saving techniques useful for urban gardening.

THE VEGETABLE GARDEN
MM. Vilmorin-Andrieux. Palo Alto, CA, Jeavons-Leler Press, 1976.
For the collector of vegetable books. English edition originally published in 1885. Presents full cultural information with excellent black and white engravings.

VEGETABLES MONEY CAN'T BUY BUT YOU CAN GROW
Nancy Bubel. Boston, Godine, 1977.
Culture, varieties and recipes for less common vegetables like sorrel, fennel, and salsify. Excellent for tracking sources for special seeds.

catalogs

Burgess Seed and Plant Co.
905 Four Seasons Road
Bloomington, IL 61701
Large tomato selection from stuffers to paste. Shallots, grapes for Northern gardens.

W. Atlee Burpee Co.
300 Park Avenue
Warminster, PA 18974
Great selection of tried and true plus the unusual such as horseradish roots, Jerusalem artichokes, purple head cauliflower.

DeGiorgi Co., Inc.
P.O. Box 413
Council Bluffs, IO 51502
Catalog 66¢
Sorrel, salsify, fennel. Good source for unusual vegetables. No nonsense catalog.

Grace's Gardens
22 Autumn Lane
Hackettstown, NJ 07840
Catalog 25¢
Specializes in the biggest, longest, etc., Italian vegetables like Italian red lettuce, Sicilian giant yellow peppers.

Gurney Seed and Nursery Co.
Yankton, SD 57078
Large, pulpy color catalog. 12 varieties of raspberries, a hardy fig, pawpaws, persimmons.

Harris Seeds
Moreton Farms
Rochester, NY 14624
First 8 pages contain Harris' "vegetables of special merit." Varieties to be trusted from this venerable firm. A subdued and elegant catalog.

J. L. Hudson, Seedman
P.O. Box 1058
Redwood City, CA 94064
Catalog $1.00
The catalog to consult when you can't find it anywhere else. Cultural directions in catalog, not on seed packets, so save it.

Nichols Garden Nursery
1190 North Pacific Highway
Albany, OR 97321
Herb seeds and plants, elephant garlic, saffron crocus bulbs, "space-mizer" vegetable seeds.

Park Seed Co.
Greenwood, SC 29647
Large offering of perennial and annual herb seeds, vegetable favorites and novelties. Ginseng plants, Fenugreek to sprout.

Stokes Seeds, Inc.
737 Main Street, Box 548
Buffalo, NY 14201
Reliable favorites plus 14 different peppers, sweet to hot. Peanuts, husk tomatoes, mushroom spawn.

Sunrise Enterprises
Oriental Seed Catalog
P.O. Box 10058
Elmwood, CT 06110
Modest catalog with text presented in English and Chinese with line drawings and black and white photos. Cook books and gardening books offered and even an English-Chinese dictionary.

Thompson and Morgan, Inc.
Box 100
Farmington, NJ 07727
Both classic and unusual vegetables presented with inspiring photos of serving suggestions and cultural hints.

Tsang and MA International
1306 Old Country Road
Belmont, CA 94002
Chinese vegetable seeds, cook books, oriental spices, including "Mongolian fire."

Vermont Bean Seed Co.
Garden Lane
Bomoseen, VT 05732
Beans for freezing, canning, drying, cooking, including the original Vermont cranberry bean. Thirty-four varieties of peas. Attractive catalog.

A Planting Schedule for a Harvest Bounty Exhibit

by Barbara K. Heckert

JANUARY

Planning a successful harvest bounty exhibit begins in January when you order the seeds.

Consider those varieties that mature later than others. Seed catalogs give much information that is useful, but experience is the best guideline. In our garden, Field's Early Springset tomato, touted for its earliness, has consistently yielded smooth uniform, blemish-free fruit late in the season.

For those vegetables that produce more than one crop in a season, make certain you order plenty of seeds for the late crop. These are sometimes not available when you want them.

Color is an important factor when planting for harvest bounty. Eggplant, red cabbage, red onions and rhubarb chard add splendid color appeal. The new golden zucchini with its bright, clear yellow is a "must."

Contrasting textures add great interest to any display of vegetables. The leafiness of kale, parsley or Savoy cabbage; the interesting rough textures of broccoli, cauliflower and canteloupe; the smooth and shiny squashes, peppers and tomatoes; the matte finish of the root vegetables all combine to emphasize and enhance the attractive qualities of each.

New or unusual vegetables contribute fun for the gardener, besides adding greatly to the interest of a vegetable display. Study the "new introductions" carefully and look for some of the oriental and European varieties that are becoming more generally available.

FEBRUARY

When your seeds arrive, sort according to time of planting.

Make a plot plan of your garden on graph paper for each successive planting of the growing season. Bear in mind that tomatoes, parsley, peppers and all of the cabbage family should be rotated each year. The legumes can thrive year after year in the same spot.

If you have mulched well and the winter has not been too severe, you will have kale, leeks and carrots to harvest before time for spring plowing.

MARCH

The middle of March is the time to start seeds under lights or in a sunny window. Tomatoes, peppers, eggplant, celery and all of the cabbage family will certainly be among those started early. You may also want to consider an early start for melons, lima beans and other slow-to-mature varieties. Put these in separate peat pots, rather than in flats, for easy transplanting.

When the soil is dry enough, do the spring plowing. Some people prefer to do this in the fall, but our late fall and winter crops do not permit this.

APRIL

Move seedlings from the house into the coldframe.

As soon as the soil can be worked, plant: spinach, potatoes, lettuce, radishes, carrots, onions, beets and peas.

MAY

When danger of frost is past, plant squash, beans, corn, cucumbers and melons. In our particular location that would not be before May 15, but it could be earlier in other locations.

JUNE

At about mid-month, start seeds for the late cabbage crop. We start ours in the coldframe, for convenience in providing TLC.

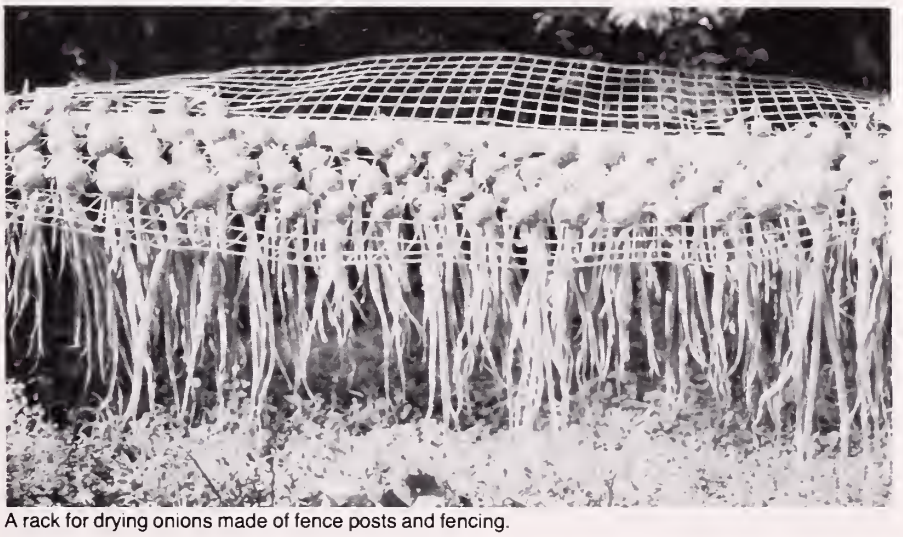
Near the end of the month plant zinnia and marigold seeds directly in the

continued

photos by Barbara Heckert



Cold frame showing light bulbs installed to provide warmth.



A rack for drying onions made of fence posts and fencing.



One of the Heckert family vegetable exhibits.



Setting out tomato and cabbage plants.

garden. With care and kind weather conditions, there is ample time to produce good bloom and mildew-free foliage for the Harvest Show.

JULY

Start broccoli and cauliflower seeds for the late crop. Plant late beets and spinach directly in the garden. Transplant late cabbage into the garden.

(Note that "days to maturity" published in seed catalogs applies to spring planting. For fall crops, add a week or 10 days.)

AUGUST

Transplant broccoli and cauliflower into the garden. Plant late lettuce, radishes, turnips, beans and zucchini.

SEPTEMBER

With vigilance and care, you will have a bountiful crop of vegetables to display at the Harvest Show and enjoy the year-round.

●

Barbara K. Heckert, this year's Harvest Show chair, has been a regular exhibitor at the Harvest Show for more than 10 years. She is a National Council Accredited Flower Show Judge.



Honorable mention. Community Garden section, 1979 Harvest Show for the 2100 N. 20th Street Garden. You can see that we did not use the background effectively. Also, all of the focus and color seems to be on one side.

Preparing A Harvest Table for the First Time

by Sharon Turner

When Philadelphia Green first asked us to exhibit the fruits of our labors on a Harvest Table at the community gardens' Harvest Show all of us were new at urban gardening. Some of us were city bred and those who were reared in the country had never participated in fairs or agricultural exhibits. We were thrilled with the invitation. Our next feeling was panic. What had we gotten ourselves into? We wondered whether anything would be left in the garden or if it would

continued

photos by J. Blaine Bonham



"Best of Day," 1980 Harvest Show for the 20th Street Community Garden. We looked at other tables and attended workshops and in just a year we were able to successfully incorporate color and design elements using several levels, including the overhead areas.



be good enough by the end of September to present in the show. Succession planting was not in our gardening vocabulary at that time. So when show time came we went out to the garden, picked vegetables and flowers, plopped them into baskets and jars, traveled to the First Bank of the U.S. (Third & Chestnut) where the show was held, arranged our offerings on the table and crossed our fingers. Surprisingly we won a red ribbon. Now it was not as easy as it sounds.

A factor called quality enters. The preparation counts. The greens are cleaned and hopefully without those holes that denote insect damage. Okra and beans should be mature and pretty much the same size. Tomatoes and eggplants edible and colorful. In other words they are to be market quality or better but they did not have to be as perfect as individual entries. The table had to show the variety of our bounty; the purpose was to not just let everyone see how prolific our tomato plants were or how big our collard greens grew.

Containers helped to display the abundance of our harvest, but we knew they should not be the focal point of our exhibit. Natural materials are preferred; for example, baskets of woven grasses, reeds or woods, wooden bowls or containers of neutral-toned pottery. Earthenware or simply plain glass vases are preferred to foil covered.

For our first table we used a large aluminum pot. This was not in our original plan but we had gathered armloads of flowers: marigolds, zinnias, sunflowers, daisies, scarlet sage, amaranthus, and My-Love-Lies-Bleeding and this was the only thing we had large enough to water them in. As we drove along and stopped for lights many admiring glances and comments reached us. We then decided since the display was so attractive we would use it as it was and took the jars and vases back home.

checking for insects

At that first show we learned the importance of checking vegetables for insects. We thought we had washed the greens and cabbages well; everything was glistening and pretty. We were later informed that the judges were having a hard time deciding between our table and another for first prize, when lo and behold aphids appeared on the cabbages. Horrors! One of the judges was kind enough to tell us about frequent cool water spraying to keep the aphids down. Luckily this was only a one day show. The incident taught us the importance of controlling insects in the garden and soaking the vegetables when gathered for the show rather than just rinsing them off.

pre-show planning

Our pre-pre-show work included deciding what we wanted to display and when it should be planted for maturity at harvest time. We pampered our plants –watered, mulched, weeded and fertilized. We watched for insects until show time. Then we considered if we would also exhibit canned or dried goods, jellies, herbal vinegars, and gave ourselves sufficient time to prepare them.

As harvest show time approached we began to think about how our table would look. In addition to choosing containers and background, we worked out special materials such as dried corn, pictures and other enhancements. We picked the best format for labeling table contents. Labeling had to be discreet enough not to detract from our exhibit and clear enough to be informative to viewers. We used a typed list.

Finally show harvest time came. We picked our vegetables and flowers the day before to allow time for hardening off. We cleaned the vegetables. We scrubbed the carrots and they looked terrible with the lines and swirls that appeared as they dried. We gathered more of everything than we needed. Some tomatoes were squashed and some marigolds lost their heads. We were careful not to strip our garden though–we felt we might need replacements later.

We staged a dry run of the table before going out to the bank for the exhibit. We wanted to see in reality if what we planned appeared as we wanted it, or if some last minute changes needed to be made. We checked: did the eye travel when looking at the exhibit? Was the shape we had chosen pleasing (e.g., u-shape or triangular)?.Were things placed on levels so they did not march straight across in rows, or was it so busy that there was nothing to focus on? Did the containers attract attention first and then the vegetables? Did all elements blend or did they look as if we were staging many individual entries on one table? Was our use of color balanced throughout? Had overhead and background space been incorporated into design?

Unfortunately, one of the items we forgot to take with us to that first Show was a camera, so there are no pictures of that first Harvest Table for which we won a red ribbon. Our triumph led to an invitation to participate in the annual Harvest Show held at Memorial Hall in 1979. We were awarded an Honorable Mention for that exhibit. In 1980 we won a Blue Ribbon plus "Best of Show."

Harvest tables offered the viewers a chance to participate in our pleasure at the success of our gardening efforts.

●

Sharon Turner is an urban gardener with the Philadelphia Green program of PHS. This year she will be chair of the harvest party committee for community gardeners.

Growing Vegetables in Containers

by J. Blaine Bonham

I don't want to mislead you. Growing vegetables in containers on my roof in order to fill the refrigerator crispers is not my motivation. My heart also belongs to herbs, to colorful sun-loving annuals, to three miniature roses and a climber, to a budding dwarf conifer collection, to perennial sempervivums and tender succulents and cacti that summer outdoors, and to an 'Ernest Markham' clematis that is thriving against an east-facing wall. So I really don't have the room for an intensively-gardened vegetable patch.

I like to grow vegetable plants in containers because many of them make handsome specimens for the garden, and container culture affords me an opportunity to observe and appreciate their growth habits. The pale lavender eggplant flowers that wither and cling to the sepals as they begin to swell and push out a shiny deep purple fruit; the prolific pepper plant that sports myriad finger fruit ranging in color from green through yellow and orange, to a mature fiery red; and shallow clay pots of diminutive ice green Tom Thumb lettuces mixed with small scarlet edged Ruby ones, colorful enough to be the centerpiece on the patio table.

I also enjoy experimenting with vegetables in different containers. Tomatoes in commercial peanut oil metal cans, scarlet runner beans in a wooden window box, peppers in plastic paint buckets, Brussels sprouts in unglazed clay pots, and lettuce in a sphagnum-lined hanging wire basket are some of the combinations I've tried so far. Not all have been successful. I enjoy these horticultural trials and tribulations. The plants themselves do not represent a significant investment of time or money, and I have fun discovering why some methods don't work, as well as how to grow an award winner.

And that brings me to my last, and surely not least, reason for container vegetable gardening. I have Harvest Show fever. I like to enter the container-grown vegetables and annuals competitive classes of the Society's yearly September event at Memorial Hall.

It all started a few years ago, when Ernesta Ballard, former PHS president, gave me a dwarf Morden's Midget eggplant plant in mid-summer with the advice that it made an excellent container plant, and that I might try to grow it for the Harvest Show. I was just getting my feet wet in this container vegetable gardening business at the time. The eggplant developed into a graceful, symmetrical two feet tall bush with several four-inch purple orbs decorating it. I just knew it was a blue ribbon winner.

I have Harvest Show fever.

So I eagerly entered it in the container-grown eggplant class and won–a second prize. I was beaten by another dwarf eggplant plant, grown by Ernesta Ballard. I was smitten, however, and my summer gardening plans always now include the Harvest Show schedule of competitive classes. I love the thrill of victory, the agony of defeat, and surely the opportunity to learn from other gardeners how to improve my growing skills.

This is the fourth season for my garden located three stories up on a Center City roof-deck. Since every plant is in some form of container, my garden is constantly changing. Container-grown vegetables, then, fit in well with my gardening life style, and I don't think it's really all that more difficult than growing most other plants in containers. The important gardening factors to consider are the same: amount of sunlight, amount of water, types of containers, and soil mixture. Here is what I have learned in my garden.

I have plenty of sun for fruiting vegetables. Whether in-ground or in-container, they still need an average six-hour daily minimum dose of sun rays for good fruit production. An adjacent wall gives me shade after 2 pm, and leafy and root vegetables placed along the wall are protected from too much sun in late summer.

Realizing that most vegetables are annual plants was an important lesson for me. (Even the truly biennial cabbages and carrots are harvested during one growing season.) Annuals grow fast. Stems and leaves appear at a surprising rate, and at the same time, a voracious network of roots rapidly spread throughout the soil. All this activity has important consequences on the cultural practices of the container gardener.

Vegetable plants need water. In a container, they can absorb much of the available water in a few hours, competing with the sun, which evaporates the rest. During hot summer months and as the plants reach maturity and roots fill containers, I find I must water every morning, and sometimes even again in later afternoon. About once a week, I fertilize the vegetables with Peter's 20-20-20 Garden Special dissolved in water to goad them into higher fruit (or leaf or root) production. Using a soil mixture that contains water-retentive materials–perlite, vermiculite, peat moss , for example–is a must to ameliorate the always potential drought conditions of container gardening. I place a layer of sheet sphagnum moss over the soil to fight evaporation and keep the roots cooler. I use mostly nonporous containers to further reduce water evaporation. I rarely use unglazed clay pots; light colored plastic containers do the best job. This compromise in aesthetics is born of necessity, since a vegetable plant that wilts too many times often does not regain its vigor.

I have learned to keep pace with the rapid growth of the vegetable plants by moving them up to larger containers as their size increases. Some container gardeners will plant the small transplant or seedlings in a container they consider large enough for the mature plant. The plant's first home is in scale to its size (small plant, small pot), and usually by maturity, it has been repotted twice. There is a danger here, for a burgeoning plant stuck in too small a pot for too long will dry out too frequently, losing its vitality and becoming stunted and unproductive. Also fruit may become dwarfed in cramped quarters. (I've grown possibly the world's smallest bell peppers on four plants jammed into a ten-inch pot. At least they tasted all right.) I've become pretty good at estimating the need for a larger pot. To make sure, I just pull the pot off the plant for a first-hand inspection. If roots are pressed all along the outside of the root ball, I repot.

continued

I wish I could report fewer insect problems in a container garden located 25 ft. up from the nearest ground. I can't. Whiteflies, red spiders, mealy bugs, aphids, slugs, borers, and cutworms have all driven me to swear to give up gardening at various times. I control the sucking insects through heavy blasts of water from the hose in non-drought periods, and I use chemical insecticides when a major invasion occurs. It's during these times when badly infected plants are trashed; it's not worth endangering more valuable specimens.

In my 1980 garden I grew 15 different vegetables (frankly only one or two specimens of some) at different times during the growing season. Pictured here are several Harvest Show entries and a few notes from my garden journal about each. By the way, I declared at the onset that I didn't grow to eat. That's not to say I don't eat what I grow. In fact, I ate the last two banana peppers in a cream cheese omelette in April. I felt smug.

●

Blaine Bonham is director of Philadelphia Green.



Salad Garden

Using 30 in. window box, 8/10 seeded: 'Tom Thumb' lettuce, 'Ruby' lettuce, 'Burpee's Goldenhart' carrots, and transplanted Italian parsley, chives.

Seeded 'Cherry Belle' radishes 8/20. Placed in semi-shade.

Won Blue Ribbon in Harvest Show

Comments: radishes sown too early; no other problems/pests



Lettuce Bowl

Grown by Patricia Schrieber on my deck

Seeded 8/10 in milk crate: Paris White Romaine, Oakleaf, Salad Bowl

Placed in shaded bed along wall

Transplanted to shallow clay bowl 9/3, with stone mulch

Won Blue Ribbon in Harvest Show

Comments: romaine needs to be sown earlier; no pests/problems; hooray, Pat!



Eggplant Pick Me Quick

Two six-week-old plants – gift from Ernesta D. Ballard. 7/31. Potted in plastic tub.

Red spider. Treated with kelthane 8/10. Leaf damage and flower drop.

Recovered beautifully. Thirty inches tall with seven fruit.

Won second place in Harvest Show (EDB won first! Drat!)

Comments: fast, easy to grow; attractive, graceful plant; fruits tender, tasty; heed "no eggplant" warning on kelthane bottle



Sweet Banana Pepper

Transplants planted individually 6/15

Three plants placed together in plastic olive container, staked 8/10

Won Blue Ribbon, Bronze medal at Harvest Show 9/27

Comments: tall, 30 in. plants; prolific, colorful 4 in. fruit; no insects/problems

Peppers are the stars of the container garden



California Wonder Pepper

Transplant put in small plastic pot 5/29

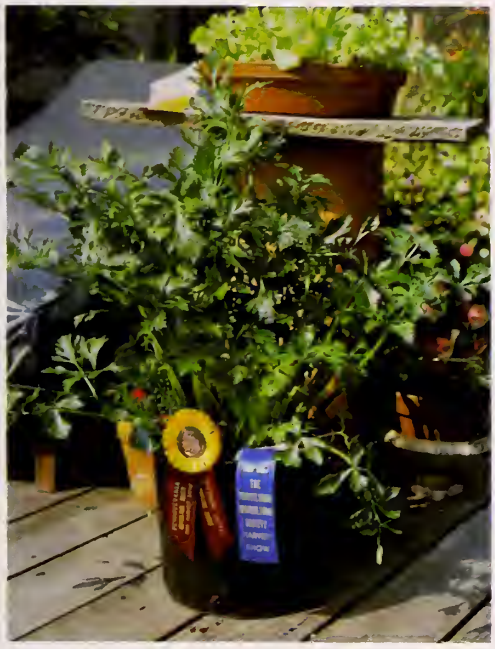
TV appearance on Farm & Garden Show 8/8

Harvested first three red fruits 8/10

Transplanted to 15 in. white plastic tub 8/10

Won Blue Ribbon at Harvest Show 9/27

Comments: many small, blocky fruit; transplanted to larger pot too late, a little dwarfed; no insects, no problems



Self-Blanching Early Celery

Three transplants placed in 15 in. plastic nursery tub 6/11

Grown behind lounge chair for shade

Individual plants remained small due to crowding

Won Blue Ribbon, Bronze medal at Harvest Show 9/27

Comments: red spider problems; stringy stalks with bitter taste



Burpee's Rhubarb Swiss Chard

Seeded in 30 in. long window box 8/10 in perlited soil

Placed along wall to avoid afternoon sun

Thinned continually, watered twice daily

Won Blue Ribbon in Harvest Show

Comments: no pests/problems; attractive, productive; ate three meals of chard



Scarlet Runner Beans

Seeded in window box on deck floor 5/8. Emerged 5/20

Leveled by cutworm 5/25. Sent up second set of leaves. Used paper collars.

Trained on nylon netting to serve as screen.

6 ft. final height. Floriferous. No bean formation until September

Comments: attractive and effective screen; poor pollination: dried out too much; red spider problems; container too small for 8 vines; beans: tasted worse than shoe leather



Squash Gold Rush (bush type)

Seeded 8/10. Collared for borer protection

Two seedlings transplanted in plastic clothes basket 8/20

Leaf fungus. Fungicide no help

Many male flowers first, few female flowers. Only three fruits. Several others rotted

"Vined" out of container

Won second prize in Harvest Show

Comments: too viney for container



How You Can Learn to Stop

by Libby J. Goldstein

Every year about a thousand people call Penn State's Garden Phone, often quite upset. They report terrible black blotches on the bottom of their tomatoes, and sometimes even on their peppers.

Yes, the vile blossom-end rot has struck again.

It is true that blossom-end rot is caused by a lack of calcium in the cells of the fruit. It is also true that applying a water solution of calcium chloride to the leaves of the plant will cause the fruit to be wonderful and healthy, even if the leaves begin to look a bit like death. But, perhaps more important, keeping the soil moisture at the roots of the plant even will generally prevent blossom-end rot, assuming that your soil has any calcium in it at all.

You may well wonder what all this has to do with gardening in the middle of a water emergency and how one is to maintain an even soil moisture level under semi-arid conditions. The answer is mulch, the more the moister. Mulch, whether plastic, rock, or organic, holds moisture in the soil by preventing evaporation where soil and air meet. If you get used to using mulch because of the water emergency, you'll probably learn to love it so much you won't ever want to garden without it again. (And we may never have to answer blossom-end rot questions, because you won't have any.)

Mulch has all sorts of benefits for the gardener besides keeping the soil moist and reducing the amount of water you need for irrigating between rains. Black plastic, rocks, or 3 in.-10 in. of organic mulch will also reduce to practically zero the amount of weeding you have to do. Weeds can't grow in the dark. Those few weeds that do make it through an organic mulch are really easy to pull–and add to the mulch. I just pull them and drop them–on the mulch.

Assuming that it will rain from time to time, the rain will just sink into an organic mulch or run through the holes you've made in the plastic. When water doesn't splash onto the soil, it doesn't splash soil and disease spores all over the plants. The soil under the mulch doesn't dry out, so it can't develop that wonderful adobe crust that so many clay soils get after a rain or overhead watering.

Mulch also regulates soil temperature. Black and clear plastic warm the soil. A dark organic mulch will absorb some heat, but not so much as plastic, and a light one will keep the soil somewhat cooler because it is a bit more reflective. A really reflective mulch, like aluminum foil or aluminized plastic, will keep the awful aphid from lighting upon your cool weather crops such as cukes and melons and injecting them with such marvels as cucumber mosaic virus.

The best grey water has the least stuff–grease, detergent residue, boron, sodium and chlorine–in it. So, water collected after bathing, showering, etc., is the best, if not easiest, to collect.

Besides, organic mulches like salt hay, wood chips, partially finished compost, newspaper and grass clippings will slowly rot down, adding to the organic matter and humus in your soil. Vegetables will grow in a soil with hardly any organic matter, but they will hate it–and tell you so.

The more organic matter you have in your soil, the less you'll have to worry about the drought. Water percolates right through light sandy soils. It can fill all the tiny pores in clay soils so that air can't move through, and the roots rot. Organic matter acts like lots of tiny sponges in the soil. It absorbs and holds water in sandy soils and creates tiny pore spaces in clay soils so that water and air can move through the soil to the roots of your fruits–and vegetables.

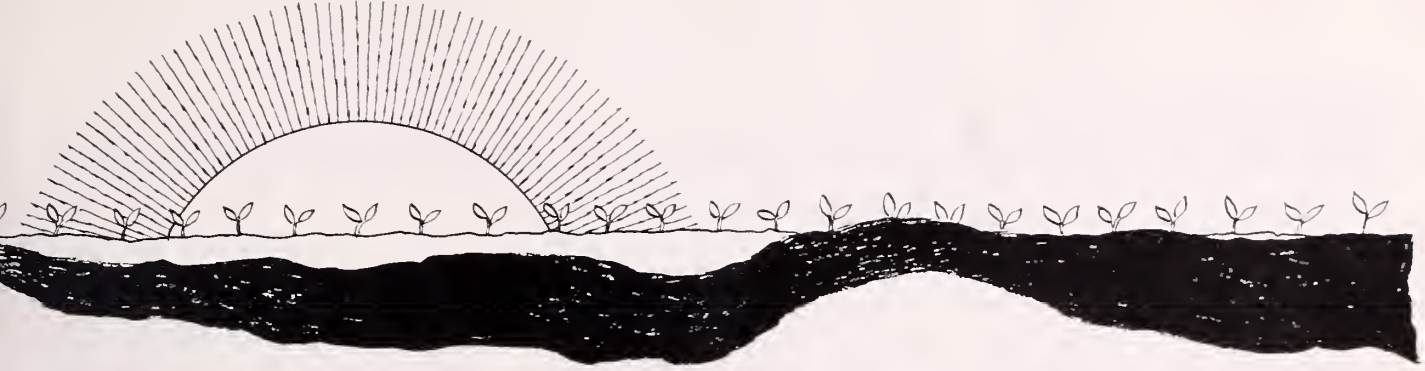
Before planting, especially in a dry soil, try to dig in four to five bushels of organic matter for each hundred square feet of growing area. Work it evenly into the top 8 to 10 inches because layers of organic matter can actually inhibit water movement. Compost is a really good and free source of organic matter, and you can save gallons of water every day by composting all of your vegetable-type kitchen wastes instead of flushing them down the garbage disposer. Well-rotted or composted manure, and sawdust, peat moss or peat humus, spent mushroom compost, licorice root and aged tree bark are also good sources of organic matter.

Once you've gardened in a wonderful, fluffy, easy to dig soil with lots of organic matter in it, you won't want to garden any other way. The first few years we worked our community garden on Christian Street, we used to do our spring soil preparation with picks. Tons of organic matter later, even our oldest gardener can turn the soil herself–with a digging fork. She won't do it 'til she's got plenty of organic matter to dig in, though.

water – getting it, storing it, recycling it

Even with lots of mulch and organic matter, a vegetable garden may need as much as 62 gallons of water per 100 sq. ft. a week. That's about an inch of rain. If there is any rainfall, it's a good idea to measure it, but you don't have to rush our and spend money on a rain-gauge. (See box.)

If you do need to irrigate, consider us-



Worrying & Love Drought

ing water that you've collected by diverting rain water from your down spout into a 55-gallon drum, or a chic wooden barrel or even a large plastic trash can. Whatever you use for storage, cover it to prevent evaporation and to keep mosquitoes from breeding.

Grey water is another irrigation resource for your garden. Grey water is simply water you've already used once for bathing, doing the laundry or washing dishes. The best grey water has the least stuff–grease, detergent residue, boron, sodium and chlorine–in it. So, water collected after bathing, showering, etc., is the best, if not easiest, to collect. Next comes laundry rinse water or a mixture of wash and rinse water. Washing compounds with boron in them can be death to plants. If you must use one, don't use the water from that wash in the garden. Chlorine bleaches can also be a problem, but if you let the water stand uncovered for a day or so, most of the chlorine should disperse into the air. Fabric softeners in the rinse cycle may also cause problems. Skip them. If you must have bouncy towels, add the softener to the dryer. Sodium from ion-exchanging water softening attachments may cause soil problems with prolonged use. If the drought continues, you may want to disconnect the softener from the system.

If you've been washing or rinsing diapers, skip that water for the garden and wait for the grown-up's wash. And if you're using a drip irrigation system, make sure you have a filter between your grey water storage system and your drip system or the pores or tubes will get clogged.

Don't get the grey water on the plants. Let it filter through the organic mulch to the root zone or lift the plastic mulch and apply it directly to the soil. If you just tip up the watering can next to the plant, you can give it a nice, deep watering without losing lots of water to evaporation. Besides, even when we're not in a drought, you want to get the water down deep in the root zone. If you don't, the roots will stay close to the surface, and the plant will be much more sensitive to even short dry spells.

Close planting in beds or wide-rows, instead of rows, will increase the leaf canopy over your soil or mulch and reduce evaporation.

Indians in the Southwest traditionally sank terra cotta bowls up to their rims in the soil and planted leafy crops, onions and root crops around them in double or triple rows. Then, instead of watering the soil, they'd fill the bowls and let the water seep out into the root zone. You can do the same sort of thing with 6 in. or 8 in. flower pots or with coffee cans with holes punched about an inch above the base. You can even add manure tea or soluble fertilizer to the pot from time to time.

Indians in the Southwest traditionally sank terra cotta bowls up to their rims in the soil and planted leafy crops, onions and root crops around them in double or triple rows. Then, instead of watering the soil, they'd fill the bowls and let the water seep out into the root zone.

Planting large plants like tomatoes and cabbages in a shallow depression will cause any rain water to flow down to the root zone. Some Southwestern gardeners even use depressed beds or high paths to make sure that the water gets to the plants and can't run off.

Raised beds tend to encourge drainage. If you already have them, make sure to mulch well. If you don't, wait 'til the drought ends to put them in.

To reduce evaporation even further, water early in the morning or in the early evening. since you're watering the soil this year and not the plant, you can even water after dinner without worrying about all those ferocious fungi attacking damp plants at night. (Of course, mites do love dry weather, but that's another problem.)

start indoors

Another way to save water is to start as many plants as you can indoors where you can keep the germinating seeds moist by putting the flats or pots or whatever in plastic bags. Keeping a seed bed damp enough for the seeds to sprout can use quite a lot of water in dry weather and is a special problem if you can't get out to the garden every day to check out the action. Just make sure you harden your young plants off before transplanting them. Give them plenty of water when you do transplant (and a high phosphorus fertilizer e.g., 15-30-15 to start them growing) and try to transplant in the cool of evening or on a cloudy day. A little sun and wind protection for the first few days will reduce the loss of water from their leaves 'til the roots take hold, and mulch, and more mulch to hold the water in the soil.

By now, someone is sure to say, "So what's so special about all this stuff? We used what you call 'grey water' in the old days. We used to dump the wash bucket on the garden." Nothing, really. Good gardeners have used some or all of these techniques for years. Sometimes it just takes a drought to get other folk to think about water enough to follow suit. It would be nice, though, if the drought cloud had water in it, instead of a silver lining.

continued

WATER & YOUR FOOD GARDEN

To have a really productive food garden you need to pay attention to your garden's water needs even when there is no drought. Lots of people are careless in good water years and it shows: black spots on the bottoms of tomatoes and peppers, split cabbage heads are all caused by poor watering practices.

In general, a garden needs about 62 gallons of water per 100 square feet per week, or an inch of rain. Put a straight sided jar or coffee can somewhere in the garden where it won't get knocked over. As soon as it stops raining, dash out with a ruler and measure the water in the container. If you wait, some of the water will evaporate and you'll get a bad reading.

If you measure an inch of rain in any week, just don't bother about watering. If you get ½ an inch, use half as much water as the list below indicates. If you measure a ¼ inch, use ¾ as much as the list shows, and so on.

What	When Water Is Most Important	How Much
Bean – dried		¾ gal/ft. of row/wk
lima	pollination & pod development	1 gal/ft. of row/wk
snap	pod enlargement	1 gal/ft. of row/wk
Beet	throughout growing season	¾-1 gal/ft. of row/wk
Broccoli Cauliflower	early in season to prevent "buttoning" tiny heads during head development	1 gal/plant/wk
Cabbage	head development, too much water after heads develop will lead to splitting	1-½ gal/plant/wk less after heads develop
Carrott	throughout growing period	¾ gal/ft. of row/wk
Swiss Chard Other Greens	throughout growing season	1 gal/ft. of row/wk
Cucumber	flowering & fruit development	1-½ gal/plant/wk
Eggplant	flowering through harvest	1-½ gal/plant/wk
Herbs	best with less, whenever they look ready to wilt	1-½ gal/plant/wk
Lettuce – head	head development	¾ gal/ft. of row/wk
leaf	throughout growing season	¾ gal/ft. of row/wk
Muskmelon	flowering & fruit development	1-½ gal/plant/wk
Onion	bulb enlargement. Stop when tops fall over.	1 gal/ft. of row/wk
Peas	flowering & pod development	1 gal/ft. of row/wk
Pepper	flowering through harvest	1 pint/plant/wk for young plants increasing to 1-½ gal/plant/wk
Radish	throughout growing period	¾ gal/ft. of row/wk
Squash – summer	bud development & flowering	1-1½ gal/plant/wk
winter		
Tomato	flowering through harvest – an even supply please	2-½ gal/plant/wk; more for unmulched staked plants
Turnip	root development	¾ gal/ft. of row/wk

Prepared by: Libby J. Goldstein, Urban Gardening Coordinator
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Pennsylvania State University/Cooperative Extension Service
Urban Gardening Program

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Libby J. Goldstein is the coordinator of the Pennsylvania State University Cooperative Extension Service Urban Gardening Program. She says she has grey water stored in a 20-gallon vault in her cellar.

Experimental Gardening Returns Runaway Production

by Amalie Adler Ascher

Yoshie Shinomoto's enthusiasm is perhaps his greatest liability, if one could call enthusiasm a liability. In the beginning, it led him to tackle too large a vegetable garden, to plant a greater number of varieties and more of them than he needed to feed the three members of the household where he lives. Thus he ended up giving away the lion's share to the neighborhood. And still there was plenty to freeze and store for the winter.

As a child, he vowed he would never have a garden. Memories were too unpleasant. His family grew crops in Tokyo, and he was compelled to do the weeding. Working outdoors in the hot, humid weather was not to his liking. Supermarket shopping was much easier. Then, seven years ago, he changed his mind.

But before that could happen, he had to revise his plans for the future. His intention was to pursue a career in economics. Winning acceptance to the London School of Economics, he failed to pass the English examination. Seeking a place where he could obtain both the necessary language skills and a high level of training in his specialty, he narrowed the choices to the University of Michigan and Georgetown University.

By chance, mutual friends introduced him to Alexander B. Griswold, who lives at Breezewood in Monkton, Maryland. The area is otherwise known as My Lady's Manor or "Horse Country." Breezewood is famous for its Oriental gardens, which from time-to-time are open to the public, and its Southeastern art collection. Griswold is president of the Breezewood Foundation, which was originated for the research of Asian history and art and the exhibition of its gardens and collection. When he learned of Shinomoto's plans, he invited him to come to Breezewood to live in the event that he chose to study at Georgetown. The offer was too good to refuse. While obtaining a Master's degree in linguistics, Shinomoto became farm and garden manager, and eventually undertook the cooking as well. Cooking and gardening seem to go hand-in-hand.

About seven years ago, he tried planting lettuce and tomatoes. The attempt was a disaster. He tried again with better results but at the cost of working harder. That wasn't what he wanted either.

He began reading and visiting community gardens, looking for ideas to try and, if possible improve upon. The gardens he saw were a living encyclopedia, illustrating plants hitherto unknown to him, and providing an opportunity to taste them as well. It was a cheap way to learn, he relates, quoting an old Japanese proverb, "One experience is worth more than 100 explanations."

During his research, he learned about the use of chemicals by commercial growers and became concerned about their unknown effects. He began to appreciate the significance of growing his own vegetables; taste is better, and freedom from chemicals assured.

His first crop of tomatoes tasted fine, but by August they had succumbed to disease. Why, he wondered, since back home they lasted till frost? He blamed the Maryland climate and the varieties, never himself. But more reading and a few inquiries brought the answer. The soil needed improving, and his tendency to smoke gave rise to tobacco virus. Moist ground helped to transmit the disease to plants. Mulching improved matters, and staking and removing suckers led to better fruit.

self-sufficient

Five years ago his aim was to grow everything needed to make the household self-sufficient. He prepred an acre-and-a-half of land, and planted everything he could think of. The total came to nearly one hundred vegetables, including two or three varieties of each. "I wanted to see what would do well here, as well as to experiment with new introductions," he explained. "I planned gradually to weed out the bad and retain the good." But he spent five hours a day taking care of the garden and that was too much. The time to eliminate had come.

Analyzing the situation, he thought to himself, "Why grow vegetables low in taste appeal, with inferior texture, or whose only contribution is novelty in color? For example, celtuce, though pretty, offered no special advantage over lettuce and celery, which were more versatile and which he grew anyway. It was expendable. "What was to be gained," he asked himself, "by growing yellow beets, yellow zucchini or white eggplant when the flavor was either not as good or no better than that of standard colors. All they did was waste space and require extra work." By dint of such savings, he pared his garden down from 42 rows, each 90 ft. long, to the same number 60 ft. long, and reduced time spent to only one or two hours a day. But he did not discard the practice of growing Ruby lettuce, whose difference in color contributes greatly to the appeal of a tossed green salad.

Winter and summer, garden-fresh salad is now routine in the Monkton household. If it's not out in the garden, it's ready and waiting to be picked from the 5 by 12 ft. cold frame. In Monkton, where the climate is comparable to Philadelphia, the time for seeding a winter crop of lettuce, he says is September 24. If started any earlier, it grows too big and won't survive the winter. Younger growth withstands the cold better than mature leaves. On the other hand, if lettuce develops while the weather is still warm, it doesn't become acclimated to the cold. Shinomoto likes to grow lettuce in a cold frame because it is energy- and cost-efficient, meeting his two chief requirements.

When he first started growing lettuce for the winter, he planted almost two ounces of seed. But half that amount is plenty. He tried almost every kind, but for taste and texture, found Buttercrunch best for winter growing. It's also easier to harvest and clean, thus saving labor, and retains its freshness.

For fall planting, Shinomoto sows thickly to retard growth during the winter. To thin plants, he harvests. The onset of harvesting coincides with the fading of the outdoor crop and takes place when leaves are 2-3 in. long. Also thinning through the winter allows for the development of large heads, which when harvested later are cut off rather than pulled out to encourage a second crop.

Shinomoto likes to plant in a cold frame because it requires no supplemental heat, generating enough to sustain the lettuce, which is not harmed by freezing. He keeps the cold frame open until temperatures drop below freezing.

continued

photos by Duane Suter



Yoshi Shinomoto inspecting a flat of garlic in the greenhouse



Yoshi Shinomoto by his cold frame filled with lettuce.

Although lettuce can take the cold, it cannot tolerate sudden changes, which cause damage to plant tissues. The growing medium consists of horse manure mixed with hay, both ingredients easy to come by in "Horse Country." Between seasons, Shinomoto eradicates weeds in the cold frame by watering them thoroughly and closing the lid, in effect, boiling them.

When the season for lettuce begins outdoors, Shinomoto plants the first crop about March 15 if the soil is not too wet, and for a continuous harvest, thereafter on the first of the month, an easy date to remember. In addition to Buttercrunch planted in the cold frame, varieties he likes to grow outdoors are Oak Leaf, Dark Green Boston, Great Lakes (a head lettuce), and Ruby. He says leaf lettuce is more nutritious and easier to raise than head lettuce. He buys none at all.

root cellar

A root cellar counts heavily in Shinomoto's scheme of things, though his is actually a commodious above-ground shed. It has a dirt floor to maintain moisture, a bin for potatoes, and lots of slatted shelves to allow for air circulation. The shed is a great energy saver, he says, because it requires no artificial heat, except when temperatures drop below zero for a week. That is when he brings in an electric heater for a day or two.

It's surprising what keeps in a shed. Through the winter, Shinomoto's is a repository for head lettuce, celery and cabbage dug with the root but never watered. Harvested spinach keeps two months with no roots. Other crops that winter in the shed include leeks, scallions, onions, shallots, carrots, garlic and turnips. The secret to successful storage, Shinomoto says, is to save only the best, discarding damaged or diseased plants, which will infect others. He prevents mildew by storing vegetables without washing them. Root crops like carrots and turnips are put by in plastic garbage cans rather than metal because they are rustproof, cheaper and lighter in weight for moving round when full. To clean the cans, he washes them each year with an ordinary detergent. Before filling with vegetables, he places a layer of stones in the bottom of the can to catch moisture. During storage, moisture may also accumulate in the lid. Shinomoto checks for this from time to time, removing the lid to allow it to dry out when necessary.

To ready root crops like carrots, beets, Japanese radishes, Jerusalem artichokes, turnips, parsnips and rutabagas for storage, Shinomoto spreads them on the ground in the shade (without washing), and allows them to dehydrate for a day or two. Left in direct sun, they dry out too much. If ventilation is especially good, only a half day's drying may be required. To determine if sufficient evaporation has taken place, he tests for moisture content with his finger. He seeks a delicate balance. Enough moisture should be removed to prevent rot and mildew, yet a sufficient supply remain to prevent shriveling. The vegetable should feel dry to the touch. The leafy tops are cut away with a sharp, clean knife just below the foliage, and vegetables piled carefully in the cans so as not to damage them. No air holes are poked in the cans lest excessive drying occur. Furthermore, if vegetables are given too much oxygen, they begin to grow.

When digging plants with roots intact, such as onions and garlic, wait until the ground is dry. Shinomoto says. Allow the soil to dry from the roots and vegetables through wind or air circulation rather than by brushing, which damages them.

To prepare the shed for winter storage, he begins lowering the temperature inside two weeks before moving in crops, opening the door when days and nights are cool and closing it when temperatures rise. By this method he can lower the temperature to 40°. But, he cautions, once food has been brought in, be careful about opening the door, lest animals enter. The first crop to be stored is potatoes, which are planted in spring and ready for digging in August.

tire culture

For easy culture and harvest, Shinomoto's favorite way of growing sweet potatoes is in an old automobile tire. A single tire is tantamount to a hill. The inside is filled with compost or a mixture of soil and compost to a level flush with the top of the tire. Three or four seed potatoes are planted around the inner edge and one in the center. During the first few days, watering may be necesssary. As soon as plants start to grow, the area surrounding the tire should be mulched level with the top to eliminate weeding. Shinomoto has a row of tires, and he mulches the space between them with horse manure. After the leaves of the potatoes have turned black from frost, he simply turns over the tire to harvest them, saving himself the labor of digging. However, he cautions, do not let

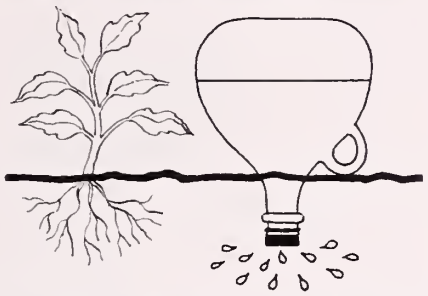
the level of the soil within the tire sink. If it falls below the inside rim, rats and mice will find lodging inside. Otherwise, he says with a grin, they are unfamiliar with this type of planting. It should be noted, too, that Shinomoto plants only sweet potatoes obtained in Japan. He dislikes the varieties in this country calling them too fibrous and small when planted by this method.

Other plants he finds suited to tire culture are squash, melons and pumpkins. In tires, they absorb more heat on a spring day, and germinate at least three days earlier. At the onset, he may plant as many as 10 to 15 seeds to a tire, later thinning to three or four. For zucchini, Shinomoto prefers Ambassador, for muskmelon Iroquois, which he says does best for him.

For other vegetables, he has come up with other tricks. To plant carrots from seed in unimproved soil and ensure that they will grow straight, he makes a hole with a stick and fills it with compost. To extend the season for tomatoes, he starts them from seed indoors at the end of January, and plants them outside early in April. But to protect them from certain frost, he digs a hole at least a foot-and-a-half deep and adds a layer of organic matter mixed with soil. He removes all foliage from the stem save the top set of leaves, and sets the plant so the top of it comes to within 3 in. of the top of the hole, laying in more organic matter and soil to cover the root section. On cold days and nights, he covers the hole with plastic, or if the plant has risen above it, a brown paper bag. As the plant grows, he fills in the hole, and with the onset of warm weather, puts down mulch. By the end of May, roots have become established and blossoms formed. Fruit is ready to pick at the end of June.

watering – economy

To economize on watering, Shinomoto came up with another idea. It is especially suited to eggplant and other large fruit, which depend on abundant moisture. Taking an old wine jug, which he says is easy to obtain if you don't already have one, he punches a hole in the cap with an ice pick. The jug is inverted and the neck buried in the soil 6 in. from a plant, providing a continuous but gentle flow of water as though discharged by trickle irrigation (see illustration). Since the jug previously contained wine, it has not been contaminated by poisonous materials, and almost no water is wasted. The system



is very efficient and convenient, Shinomoto says. Last year, he planted 40 eggplants, which were far too many. This year, he's cutting the number in half and still expects to have plenty. He peels, slices and sautés eggplants in soybean oil, and freezes it to use as needed with ground beef and onions.

There's a secret to freezing onions properly, too, Shinomoto says. When frozen raw, they're apt to get mushy and rot. Nor do they last very well in the refrigerator after they've been cut. So he chops them in the food processor and sautés them withholding salt and pepper. He freezes onions (Bermudas) in packages of 3 cups each to a plastic container. Onions store better, he says, when they are smaller in size and the stalks thin. By preparing a large batch at a time, he saves energy and time, and avoids repeating the process several times over.

To get lima beans off to a good start, he first soaks the seeds in water, thus improving germination by 80%. Once plants have germinated and are out of the ground, they have passed the hurdle of being cut down by bacteria. A few days can make a difference.

Spinach stays in the ground all winter. It is planted on August 16. In mid-February, Shinomoto says, it begins to grow and produces leaves for picking by the time the weather breaks. Watercress too waits outdoors year-round ready for eating. It grows in a pool containing sludge. Watercress is a weed, Shinomoto says, and from a handful of plants will cover an area 6 ft. by 7 ft. in the span of a year. Since the bud lies at the base of the petiole, planting is a simple matter of sticking it in the mud. Plants can live in swampy conditions (they will also grow in wet sand or soil), but not in stagnant water. They need oxygen and a current of running water. They are nice to have in winter for their high content of vitamin C.

Garlic is another plant for which Shinomoto sets his own rules. By planting it in the greenhouse in a flat (the deeper the better to provide their long roots with plenty of room) in mid-February rather than in mid-April as is customary, he gains eight weeks and two to three times the yield. (In hot weather, members of the onion family stop growing and in June they bolt.) Shinomoto's flat is 16 in. by 24 in. by 6½ in. deep. At first, he planted 50 bulbs, which were too many. Garlic grows better and larger when there are fewer plants and more space. The medium is a mixture of half cow manure and loam, and the plant variety, Elephant garlic, chosen because it is easier to peel and clean.

Garlic needs sun for the tops to develop, which occurs quickly after roots have formed. Bulbs should be set only partway in the soil, the upper third to one half portion lying above the surface. When moving them outdoors, mix organic matter into the planting hole, Shinomoto says. If growing for the bulb rather than for flowers or seeds, pinch out the flower bud as soon as it develops.

To harvest, he waits until the foliage turns yellow to allow the nutrients to be taken up by the bulb, leaving it to cure two to three weeks longer. He digs bulbs on a "nice," dry day, laying them on bare, dry ground in the sun for three to four days or until thoroughly dry. They are then placed in a bushel basket and stored in a protected dry place. Garlic doesn't germinate if kept dry and cool, Shinomoto says. It is also practically disease-free, and though worms sometimes bother it, they are not a major problem.

To prepare garlic for use, he processes a quantity at a time (peeling and cleaning) and stores it in an air-tight container in the refrigerator to use as needed. It lasts two months. He also chops it in the food processor and stores it in the freezer.

In whatever he does, Shinomoto tries to cut down on work and waste. "I always start out too big and have to cut back. But I never give up," he adds with a smile, "and neither should others."

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Amalie Ascher is a frequent *Green Scene* contributor.

Pests in the Vegetable Garden: *A Way to Manage Them – IPM*

by Ann Rhoads

photos by Ann Rhoads



Colorado potato beetle on eggplant – adult and eggs

The concept of Integrated Pest Management (IPM), which has proven so successful with a number of farm crops, is applicable to the home garden. Basically the goal of IPM is to reduce pests to tolerable levels while minimizing adverse effects on the environment. A gardener can do that by taking these steps:

1. Obtain an accurate diagnosis of the pest. Help is available from the Morris Arboretum Plant Clinic (CH7-5777), the Penn State Urban Gardening Program Garden Phone (224-7870), the PHS Hotline (922-8043) or numerous books and pamphlets.

2. Determine whether the pest is present in sufficient numbers to constitute a real threat. Monitor populations regularly to see if they are increasing or decreasing. Many plants can support significant numbers of insects without noticeable loss of yield or quality. It is neither necessary nor desirable to eliminate all pest insects from the garden especially if parasites and predators are active.

3. If control is needed, consider carefully how and when to do it. A wide range of strategies is available including the use of resistant varieties, modified cultural practices, mechanical barriers, trapping, and biological and chemical controls. Chemical pesticides have a definite role in an IPM program but they should only be used when other possibilities for control have been ruled out. I am hesitant to recommend the use of chemical pesticides in the vegetable garden, especially during the harvest, due to residue problems.

The other major eggplant pest is the Colorado potato beetle. Handpicking is the only way to control this insect as it is now resistant to all the insecticides formerly available for control.

4. Observe regularly to determine the effectiveness of control measures.

avoidance is best

Avoiding pest problems is always the best strategy. One way to do that is not to grow crops with hard-to-manage pest problems; for example, white potatoes are certain to attract large populations of Colorado potato beetles. Seed catalogs list information about insect or disease resistance in their descriptions. Tomatoes with the designation VFN are resistant to verticillium wilt, fusarium wilt, and root knot nematode. You can find beans that resist bean mosaic virus and rust or cucumbers resistant to cucumber mosaic and downy mildew. Take advantage of these triumphs of plant breeding and selecton. I think we'll be seeing more and more of it in the future.

Snap beans are one of the easiest crops to grow in the home garden. They are a particularly satisfying vegetable for beginning gardeners as the seeds are large and easily handled and the crop matures relatively quickly. Successive plantings will result in a summer-long supply of delicious fresh beans.

The Mexican bean beetle *(Epilachna varivestis)* is the only serious pest of this crop. Fond of all types of beans, the bristly yellow larvae of the bean beetle will make lacework of the leaves and greatly reduce pod production if present in large numbers. Early plantings of beans may avoid serious damage, but by mid-season the beetle population has generally reached epidemic proportions.

Picking off the larvae and crushing egg clusters is a possibility if the number of plants is small. Examine each leaflet underneath and repeat the process every few days. Or you can spray with rotenone or dust while the plants are young, before pods have formed. It is important to cover the lower leaf surfaces where the larvae feed.

A small wasp *(Pediobius foveolatus),* which parasitizes the bean beetle larvae, is effective on soybean fields in New Jersey where it has been used for several years now. One drawback is that the wasp cannot winter over, which means that it must be reintroduced each year. The U.S. Department of Agriculture Beneficial Insects Research Laboratory at Newark, Delaware is currently working with another strain of the parasite, which they hope will prove to be hardier. Within a year or two cultures of this highly beneficial insect may be available for home garden release.

Many a gardener has been disappointed at seeing cucumber and melon vines wilt and die just as the first fruits are ripening. A bacterium *(Erwinia tracheiphila),* transmitted by the striped and spotted cucumber beetles, is the cause. The feeding of the beetles themselves would be of relatively minor significance were it not for the fact that the insect often carries the pathogen in its saliva. In fact the disease causing bacteria survive the winter in the hibernating adult beetles.

How can you avoid the loss of cucumber and melon plants just as they are reaching their productive stage? Only by preventing the beetles from feeding on the young plants. From the time of germination until the plants start to bloom is the critical period. Pesticide sprays such as methoxychlor have been recommended during this period; however, methoxychlor is pretty strong stuff for a vegetable garden. In previous years I've planted more than I actually wanted expecting to lose some. This year, however, I am going to cover each hill of young plants with a 2 ft. x 2 ft. x 6 in. cage made of window screening. By the time the plants outgrow the cages they will have outgrown the danger of a systemic infection.

Squash vine borer is another cause of frustration for lovers of zucchini and yellow summer squash. The adult insect is a bright red clearwing moth. Eggs are laid on the stems of squash vines near the soil line. After hatching, the larvae bore into the stem creating large tunnels, which eventually cause the plants to collapse and die. An alert gardener can spot deposits of frass (moist sawdust) produced as the larvae eat their way in. Surgery with a small knife blade or a wire poked into the hole can often eliminate the borer. If covered with moist soil the vines may even produce roots at the wound. I have also used the pesticide Sevin (carbaryl) squirted directly on the squash stems with good results. Always apply it in the evening to avoid periods when bees are active on the flowers, and spray only the stems; there is nothing to be gained by spraying the leaves.

Another squash problem is squash mosaic virus. The first sign is yellow spots on a few of the leaves. As the disease progresses the fruits may become distorted and streaked with green; however, they remain perfectly edible. The virus is transmitted by aphids from weeds, which serve as virus reservoirs. Some commercial growers have had good results with aluminum foil mulch around the squash plants to repel migrating aphids. Diseased plants can also be removed as soon as they are noticed to prevent further spread.

. . . a velvety green caterpillar, feeds voraciously on the outer leaves of cabbage and works its way deep within the broccoli clusters where it poses more of an aesthetic problem, when cooked worms appear on the dinner table.

Tomatoes, perhaps the most popular of all vegetables in the home garden, can usually be grown without using toxic pesticides. Whiteflies, although sometimes alarming in their sheer numbers, rarely pose a serious threat outdoors. A trap made by painting a board bright yellow, coating it with heavy oil or vasoline, and hanging it near the plants greatly reduces whitefly numbers. When the foliage is agitated the whiteflies fly up, are attracted by the yellow color and get stuck.

worms, beetles, and others

The tomato hornworm is a pest easily dealt with by the observant gardener. These large but well-camouflaged caterpillars are hard to spot but the telltale signs of their presence are more obvious. Feeding voraciously, they can strip entire branches of foliage in a few hours. When bare branches and prominent droppings are seen a careful search will usually turn up a hornworm nearby. The caterpillar can then be removed by hand and disposed of. I was fortunate last summer to find a hornworm that had been parasitized by a small braconid wasp. The wasp lays its eggs on the caterpillar, the wasp larvae feed on their insect host and eventually form oval, white pupae, a number of which may be attached along the caterpillar's dorsal side. The parasitism so weakens the hornworm that it eventually ceases feeding and dies without completing the transformation to an adult sphinx moth. This example of biological control is not uncommon. If you find a parasitized hornworm don't destroy it, rather let the wasp parasites mature.

Eggplant is a crop with considerable attractiveness for insects. The battle starts when flea beetles attack transplants as soon as they are set out in the garden. I generally use some malathion or Sevin to protect the plants while they are small as the leaves would be completely skeletonized otherwise. After the plants reach a height of 10 in. to 12 in. the beetles pose less of a threat and spraying is no longer necessary.

The other major eggplant pest is the Colorado potato beetle. Handpicking is the only way to control this insect as it is now resistant to all the insecticides formerly available for control. It is the brick-red larvae that are most destructive. Clusters of yellow or orange eggs, most often located on the under surface on the leaves, should also be sought and crushed. The adult beetles, which are yellow with black longitudinal stripes, should also be destroyed lest they lay more eggs.

American entomologists have recently received cultures of several microbial parasites used to successfully control the Colorado potato beetle in Europe. Perhaps we will soon have additional control for this destructive insect.

The imported cabbage worm is a serious pest of the cole crops: cabbage, Chinese cabbage, cauliflower, and broccoli. The adult insect is the small

continued

Pests in the Vegetable Garden:
continued



Tomato horn worm



Colorado potato beetle larvae



Spinach leaf miner



Squash mosaic virus



Squash vine borer damage

white butterfly often seen flitting about the garden. The larval stage, a velvety green caterpillar, feeds voraciously on the outer leaves of cabbage and works its way deep within the broccoli clusters where it poses more of an aesthetic problem, when cooked worms appear on the dinner table. With care the imported cabbage worm and very similar cabbage looper can be handpicked from young plants. Fortunately, there is an effective biological control agent available also. *Bacillus thuringiensis* (sold as Dipel, Thuricide, Bt, etc.) is a bacterial disease specific for butterfly and moth larvae. Because it is completely nontoxic to humans and other forms of life including the parasitic and predatory insects it is an ideal material to use. Mix it with water as directed, add a few drops of soap or liquid detergent as a sticker-spreader and apply to plants with a watering can or sprayer. Repeat every seven to ten days.

For those who enjoy garden fresh spinach, swiss chard, or beet tops the spinach leaf miner can sometimes be a problem. Prompt removal and destruction of mined leaves is advisable to prevent the larvae from reaching adulthood and initiating a new generation of miners. I do not recommend spraying due to high surface residue problems on the edible foliage. The use of shields of window screening over the rows might be an effective technique, although somewhat laborious. If miners appear, spinach leaves should be harvested quickly before they can be attacked.

Cutworms are, for the most part, a pest of newly transplanted plants, e.g., tomatoes, broccoli, peppers and cabbage. They chew the stem off right at the soil line, leaving the fallen top to shrivel. The culprit, a grey or brown smooth-skinned caterpillar, can often be found nearby just below the soil surface. The most practical defense is to install a mechanical barrier around the base of the stem at the time of planting. A paper cup with the bottom cut out or a toilet paper tube will serve if pushed down at least an inch into the soil around the stem.

Slugs are a general garden pest in moist weather. These terrestrial snails-without-shells feed at night on tender foliage and fruits that are close to the ground leaving a glistening slime trail as evidence of their movements. During the day they hide in moist, dark places. Although there are poisonous baits available for controlling slugs, I would not advise using them where children or pets frequent the area. Modifying the habitat to reduce daytime hiding places is one way to proceed. Remove boards, rocks, or other potential slug shelters from the garden. You can deliberately trap slugs by placing upside down flower pots or similar objects in the garden. During the day the slugs can be collected and disposed of. Where slugs are attacking a particular plant, surround the plant with coarse dry sand or ashes. Slugs are unlikely to cross dry, gritty materials. Do not put salt on slugs; while it will certainly kill them, it isn't good for the soil.

Some commercial growers have had good results with aluminum foil mulch around the squash plants to repel migrating aphids.

aphids

Aphids are another general pest in the garden. Many different species of aphids attack a wide range of plants. Aphids often occur in large numbers on the growing tip of the plant where their feeding may cause severe stunting of new growth. Aphids also transmit a number of serious virus diseases. Soapy water spray (one tbsp. of soap flakes to one gallon water or four tbsp. of mild liquid detergent to one gallon of water) seems to be as effective as anything else you can do. Even a forceful spray of water can reduce aphid numbers to tolerable levels. Several parasites and predators of aphids are common in this area and will likely be active in a garden where little or no pesticide is used. Larvae and adults of both the brown and green lacewing are capable of consuming dozens of aphids each hour. In addition, several small wasps lay their eggs in the bodies of aphids thereby parasitizing them. Feeding by the wasp larvae kills the aphid although its exoskeleton remains intact. Parasitized aphids can be recognized by their swollen appearance and shiny, tan color. After the mature wasp has emerged a small circular hole can be seen in the back of the aphid shell.

An example of an insect pest unlikely to cause serious damage in the garden is the larva of the tiger swallowtail butterfly. This yellow, green, white, and black striped caterpillar feeds on the foliage of dill, parsley and carrots. Although you may find several in the garden, rarely are they present in sufficient quantity to cause a problem. I usually let them feed, with the thought that the beauty of the butterflies more than offsets the chewing of the larvae. Just watch for them when picking parsley for the salad.

The pleasure and satisfaction resulting from growing your own vegetables may sometimes be tempered by problems with garden pests. However Integrated Pest Management provides a framework for a commonsense approach to coping with insect and disease problems with minimal use of toxic chemicals. Armed with an awareness of potential problems, an observant eye, knowledge of appropriate preventive measures, and a little luck, you can avoid serious disappointments.

●

Ann Rhoads is the plant pathologist at the Morris Arboretum. She is also a committed vegetable gardener. Her 75 ft. x 50 ft. garden in Bucks County supplies the family with vegetables year-round: fresh vegetables from May through early November, canned and frozen during the remainder of the year.

THE green scene

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Zuk, Judith – Laurel Hill Cemetery ... May,18

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Raised beds, rose garden, yew and hemlock hedges, belgian block paths, and one scotch pine. See page 3.